Supplement to this day's issue.

"Step after step the ladder is ascended."—George Herbert, *Jacula Prudentum.*
Agriculture is the most healthful, most useful, and most noble employment of man."—WASHINGTON.

THE

TROPICAL AGRICULTURIST:

(ESTABLISHED 1881.)

A MONTHLY RECORD OF INFORMATION FOR PLANTERS

OF

TEA, CACAO, COFFEE, PALMS, RUBBER, CINCHONA, SUGAR, FIBRES, COTTON, TOBACCO, SPICES, CAMPHOR, RICE,

AND OTHER PRODUCTS SUITED FOR CULTIVATION IN THE TROPICS:

Circulating in India, Ceylon, Burma, Straits, Java, Sumatra, Borneo, Northern Australia, Queensland, Fiji, Mauritius, Natal, East and West Africa, West Indies, South and Central America, California, Southern States, and throughout Great Britain.

BRITISH MUSEUM NATURAL HISTORY

EDITED BY

J. FERGUSON,

Of the "CEYLON OBSERVER," "CEYLON HANDBOOK AND DIRECTORY," "PIONEERS OF THE PLANTING ENTERPRISE," PLANTING MANUALS, "CEYLON IN 1893" (ILLUSTRATED), &c.

"It is both the duty and interest of every owner and cultivator of the soil to study the best means of rendering that soil subservient to his own and the general wants of the community; and he, who introduces, beneficially, a new and useful *Seed, Plant or Shrub* into his district, is a blessing and an honour to his country."—SIR J. SINCLAIR.

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1902.

TO OUR READERS.

In closing the Twenty-first Volume of the "**Tropical Agri ulturist**," we would as usual direct attention to the large amount of useful information afforded and to the great variety of topics treated in the several numbers. From month to month, we have endeavoured to embody in these pages the latest results of practical experience and scientific teaching in all that concerns tropical agriculture; and our ambition has been to make this periodical not only indispensable to the planter, but of service to business-men and capitalists, never forgetting that agriculture trenches upon every department of human knowledge, besides being the basis of personal and communal wealth.

While directing our attention chiefly to the products prominently mentioned on our title-page, we have always taken care to notice minor industries likely to fit in with sub-tropical conditions; and our readers have an ample guarantee in the index pages before them, that, in the future, no pains will be spared to bring together all available information both from the West and East, the same being examined in the light of the teachings of common sense as well as of prolonged tropical experience in this, the leading Crown and Planting Colony of the British Empire.

Special attention has, for a few years back, been given to the introduction and extension in Ceylon, the Straits, Burmah, &c., of an industry in rubber-yielding trees (more especially in the planting of Para and Castilloa trees), and much literature on the subject will be found throughout our pages; also on cacao in Central America and the West Indies as well as in Ceylon; to "Spices" of various kinds (nutmegs, camphor, &c.); to palms, especially "coconuts" in different districts; to coffee and allied products in Brazil, Mexico, Costa Rica, East Java, Nyassaland, British Central Africa; Liberian coffee in Sumatra, Java, the Straits Settlements; and to other new developments in palms and tobacco planting, &c., in the Malayan Peninsula, Sumatra and North Borneo, as well as in this Island.

The Tea-planting Industry has sprung into so much importance in India (South as well as North) and Ceylon, as also in Java, that a considerable amount of space is naturally given to this great staple; and with reference to all Companies' Reports, to Sales and Prices, as well as to hints for economising, we think it will be admitted by impartial judges that the *Tropical Agriculturist* should be filed, for the convenience of planters, in every Tea Factory in this Island, in India and in Java.

A full and accurate Index affords the means of ready reference to every subject treated in this, the Twenty-first Volume, which we now place in our subscribers' hands, in the full confidence that it will be received with an amount of approval, at least equal to that which has been so kindly extended to its predecessors.

To show how fully other Products besides Tea are treated in this volume, we may mention the number of entries under several headings as follows:—Coffee (including Liberian) 28; Cacao 20; Indiarubber 59; many to Gutta Percha; to Coconuts and other Palms, Rice and other Grain, Cinchona, Camphor, Cloves, Fibres, Tobacco, Fruits and Miscellaneous Products nearly 1,000. In the 21 volumes, the references to Rubber, Cacao and Coffee number many thousands, as also to Coconuts and other Palms.

A "Topical Index" to the twenty-one volumes is in course of preparation.

We are convinced that no more suitable or useful addition can be made to a Planting Company's Library or gift to a tropical planter or agriculturist, whether he be about to enter on his career, or with many years of experience behind him, than the twenty-one volumes of our periodical which we have now made available. They are full of information bearing on every department and relating to nearly every product within the scope of sub-tropical industries.

In conclusion, we have to tender our thanks to readers and contributors, and our wish that all friends may continue to write instructively and to read with approval; for then, indeed, must the "**Tropical Agriculturist**" continue to do well.

J. FERGUSON.

COLOMBO, CEYLON; 7TH JULY, 1902.

☞ **All Planters of New Products or Pioneers in new lands should not fail to order this periodical as their best instructor.—Every Tea Factory, Coconuts or Cacao Store ought to have a file of the TROPICAL AGRICULTURIST, which contains a vast amount of information about these products, and a Record of the Tea and other Produce Sales.**

The Portraits and Biographies of some more OLD COLONISTS AND PLANTING PIONEERS are likely to appear in the next Volume.

ORDER FOR THE

"TROPICAL AGRICULTURIST."

.. ..

....1902.

Sirs,

Please forward the above publication from the beginning of Vol. XXII, *1st July, 1902.*

Please send also (lettered as for.................................*Estate) Vols.* I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII, XIII, XIV, XV, XVI, XVII, XVIII, XIX, XX, AND/OR XXI, *for* 1881-2, 1882-3, 1883-4, 1884-5, 1885-6, 1886-7, 1887-8, 1888-9, 1889-90, 1890-91, 1891-2, 1892-3, 1893-4, 1894-5, 1895-6, 1896-7, 1897-8, 1898-9, 1899-1900, 1900-1901, AND/OR 1901-1902.

I am, Sirs,

Yours faithfully,

....

To Messrs. A. M. & J. FERGUSON,

"CEYLON OBSERVER" OFFICE,

COLOMBO, CEYLON.

SUBSCRIBERS TO THE

"TROPICAL AGRICULTURIST"

are reminded that with the June Number, already received by them, and the Index and Title-page now issued, the TWENTY-FIRST VOLUME (1901-1902) is closed.

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Covers for binding the Twenty-first Volume, July 1901 to June 1902 (862 pages) can be obtained for Rs. 1·50. Cost of binding and cover Rs. 2·50.

WHAT IS THOUGHT OF

THE "TROPICAL AGRICULTURIST."

A gentleman resident in the Central Province, who has as good opportunities of knowing what is of benefit to Planters as anyone we know, sent us the following explicit testimony to the value of the "*T.A.*":—

"Since its commencement, I have regularly seen and perused the *Tropical Agriculturist.* There can be but one opinion that its scope and object are highly important, and that it supplies a distinct desideratum, which it is to the interest of every estate proprietor, to have available in the bungalow for the use of his *locum tenens*, or superintendent. As a magazine it provides varied and instructive fresh literature at intervals; deprived, as most in Ceylon are, of easy access to libraries; and as years go by it will growingly become 'The Ceylon Encyclopædia' with reference to agricultural operations. Viewing estate property as practically a permanent investment to any proprietor, the trifling charge of R12 per annum—a rupee a month—is certainly of no account, provided the separate numbers are kept and bound together yearly as a book of reference for the benefit of the manager and his successors. In that light, as the property of an estate to be handed over just as much as its office furniture, few proprietors would probably refuse to authorise its being taken and filed regularly (if the periodical was brought under their notice), more especially as on looking over the most recent volume one cannot fail to see how much valuable information on 'Tea' has been collated. In the belief that 'Tea' has restored prosperity to Ceylon, and that plantation property is a good investment for capitalists, such should not omit the office and connected equipment so advisable on all 'pucka' estates, a part of which should be the *Tropical Agriculturist.* I find I have gone on writing, but, as I am getting the numbers for the past year ready to be bound, the volume is before me."

THE VALUE OF THE "*T.A.*" to CEYLON ESTATE OWNERS.—A planting correspondent wrote some time ago:—"I think proprietors should supply every tea estate with the *T.A.* The information in it with regard to everything in connection with tea, &c. is invaluable: it would pay its value over and over again. Owners of estates should not leave it to hard-up superintendents to take it in."

A CORRESPONDENT WRITES:—"I venture to say the volumes of the *Tropical Agriculturist* will be at a premium a few years hence; it is a book which is bound to rise in value as time rolls on, and subscribers will probably, if they so choose, be able to sell at a handsome profit, besides having had the benefit of using the information in the meantime."

FROM A PROPRIETOR:—"I wonder how many planters know what they lose in not subscribing to your wonderful publication? The cost is absolutely nothing, compared to the convenience of having in at bound book all that is interesting and necessary in the literature of their calling. Information culled from a thousand sources, price lists of all produce sold locally, and home advertisements not seen elsewhere, and a hundred other things necessary for them to see and to know. The *T.A.* is, in fact, a convenient file of useful information daily arising and permanently preserved."

SIR W. T. THISTLETON DYER, F.R.S., F.L.S., C.M.G., OF KEW GARDENS:—"Sir Joseph Hooker and myself always look out for the successive numbers of the *T.A.* with eagerness, and I keep a file in my office for reference. It is impossible to speak too highly of the utility of such a publication and of the way it is managed."

SIR GEORGE KING, LATE OF THE CALCUTTA GOVERNMENT MUSEUM:—"I know your *Tropical Agriculturist* well, having carefully secured every number since the beginning. You have succeeded in making it a wonderfully useful magazine of information for planters."

SURGEON-MAJOR BIDIE, F.L.S., OF THE GOVERNMENT CENTRAL MUSEUM, MADRAS:—I find the *Tropical Agriculturist* a most interesting and useful publication. It finds a place on the table of our Public Library and is much prized."

The TROPICAL AGRICULTURIST MONTHLY.

XXI. COLOMBO, JULY 1st, 1901. No. 1.

PLANTING PRODUCTS IN THE STRAITS.

(*From Annual Report of United P. A. Malay States.*)

COFFEE.—In an Interesting Report the Selangor Planters' Association shows that in the principal European countries and the United States of America, the consumption of coffee during approximately the last 10 years has increased from 1,101,146,000 lb. to 1,495,296,000 lb. and that the rate of consumption per head of the total population of the same countries has risen from 2·83 lb. to 3·59 lb. These figures are obtained from a return supplied to the House of Commons dated 3rd August, 1900, and may therefore be regarded as absolutely reliable. It is explained that accurate returns of production were not obtainable, owing to the ignorance of "statistical science" on the part of producers, principally in the Central and South American States, so that it is to the London Brokers' Reports that we have to refer for statistics regarding the balance of production over consumption, in other words, for the world's stocks; and these we find by latest advices to amount to 1,449,000 bags (a bag being approximately a pikul) as against 659,000 bags a year ago.

The Director of the San Paulo Agricultural Institute has complied a valuable report upon the existing condition of the estates in Brazil and their future prospects, and, without quoting from it at any length, it is sufficient to say that most estates are burdened with heavy mortgages, that they require much greater attention, especially as regards manuring, than they are receiving, whilst the rise in the value of the milrei from 8 13-32*d.* to 11 19-32*d.* in the last year (Rucker and Bencraft's Circular of 21st March) cannot exercise other than an extremely deterrent effect upon that industry. The Brazils (Rio and Santos) produce such an enormous percentage of the world's supply, that an even partial collapse in that country would undoubtedly result in greatly improved values. The date of the San Paulo report is not known, but when it was written the milrei was 6½*d.*, and we find it stated that "with exchange a 6½*d*, and coffee at $15 in Singapore [*i.e.* Mexican dollar value] 3½ per cent interest could be paid on the capital"; again, if the Brazilian planter had to pay his labourers in gold he would have been ruined long ago, but he *sells his coffee in gold* which he reconverts into milreis, and the consequent effects of a rise of 3 3-16*d.* in one year and of 5 3 32*d.*, since that report was written, must be diastrous in the extreme. There is no denying, however, that the world's stock of coffee has increased over 100 per cent. in the last year, and the only conclusion to be drawn is that mortgagees have foreclosed and resold to a large extent, and that estates, at consequently a much lower capital value in other hands, are still capable of being worked at a profit. Your Committee have endeavoured to obtain statistics of coffee exported from Selangor, Negri Sembilan, and Perak. The following figures have resulted from their efforts:—

	1898. Piculs		1899. Piculs		1900. Piculs
Selangor ...	22,948	...	26,407	...	34,295
Negri Sembilan	3,163	...	4,541	...	6,199
Tota..	26,111	...	30,948	...	40,494

We have not been successful in getting any returns from Perak, but from this State and other sources it is probable that the total production, in 1909, amounted to at least 50,000 pikuls, or say, roughly, 3,000 tons. That we have not been idle in endeavouring to get our coffee, straight from the plantations, brought

prominently before the public will be seen from reference to the snbject elsewhere in this report, but it must be admitted that we are far from being satisfied with our curing, though year by year no doubt the quality improves. There is a growing feeling that possibly a more acceptable coffee may be produced by sun-drying the cherry, and your 1901-1902 report will undoubtedly supply you with the result of several systematic experiments which are now being undertaken.

RUBBER (*Hevea Braziliensis* or *Para*).—This variety of Rubber continues to come on exceedingly satisfactorily, the average growth of trees from nine months upwards amounting to about 1 foot per mensem, whilst at three years their average circumference at 3 feet from the ground is about 16 inches. This far exceeds anything reported from Ceylon and other countries where Para is being planted, and we consider that Mr. Curtis's description, in the 1900 annual Report on the Botanical Gardens of the Colony, of the tapping of the 15-year-old Para tree in the Gardens at Penang, is conclusive evidence of the contention of the writer "that in this cultivation lies a source of wealth of the greatest importance." In two years 12½ lb. of dry marketable rubber were procured "without any apparent injurions result to the health of this tree," and the conditions under which it is growing are reported as anything but favourable. It appears, in the opinion of the different Directors of the Botanical Gardens, that the size of a tree more than its age indicates its fitness for tapping, and probably a circumference of 30 inches 3 feet from the ground is the limit at which attempts to extract the rubber should be commenced. Reports from London show that prices for Para have of late declined, one reason alleged being the falling-off in the demand for bicycles, but in Para rubber we have undoubtedly the most valuable and highest quality rubber in the world, and your Committee feel that the large number of trees, amounting now to several millions, planted in the Federated Malay States, must, in the not very distant future, prove a source of revenue which will largely recoup the planters for the losses which they have snstained through the decline in value of Liberian coffee.

FICUS ELASTICA (*Gutta Rambong*).—The only interesting faot that your Committee have to report over and above the continued luxuriant growth of this tree is the wonderful result obtained by Mr. R. Derry, of Perak, of 25 lb. per tree from two 19-year-old trees at Kuala Kangsar in one tapping. In your Annual Report for 1899-1900 it was recorded that some Ficus Elastica rubber which was sent home by Mr. Derry was valued at 3/6 per lb. as against 3/10 for the Para rubber sent to London for sale by the same gentlemen. Assuming, then that the F. Elastica rubber resulting from the above-mentioned tapping in any way approximates in value the quotation for the former shipment, it is clear that, in this variety also, planters will have a valuable source of revenue. Mr. Derry's conclusions on the subject of tapping Ficus Elastica are that trees may probably be first worked when from four to five years old, and that the average yield should amount to ½ lb. for every year of the tree's age, the cost of collection, both with Para and Ficus Elastica, being from 30 cents to 35 cents—*i.e.*, 7½*d.* to 9*d.* per pound.

COCONUTS.—During the past year many reports have come to hand of trees planted as seedlings, about 2 feet high, from two years and ten months, to three years and three months ago, throwing out bunches of spike and blossom which has set well, and now form sturdy bunches of young nuts. These coconuts are the common variety which have hitherto been supposed only to commence flowering in their fifth to sixth year, and there can be no doubt that, as with both kinds of rubber, the growth of our coconut trees also is quite abnormal. There are thousands of acres of alluvial land in the Malay Peninsula, capable of being converted into flourishing rubber and coconut properties, and your Committee feel that, when the investing publio know and realise this, agriculture in the Malay Peninsula will receive a stimulus which will lead to infinitely more extensive operations than we have had any experience of in the past.

SUGAR.—Your Committee hear that great success has attended the sugar industry in Perak during the past year, and that enormous extensions are being contemplated. Unfortunately, however, Perak takes little interest in our Association, and we are not in a position to supply you with any data.

INSECT PESTS.—The season under review has, on the whole in Selangor, been free of severe attacks of insect pests, the bee hawk moth oaterpillar has broken out rather badly on a few estates, but no damage to speak of has been done, the eggs, caterpillars, chrysalids and moths having been promptly collected by hand and destroyed. In Negri Sembilan, however, a bad outbreak is reported, which led, in one instance, to the cutting out of all the coffee on a large Chinese estate, and caused some considerable damage to a neighbouring property. Various caterpillars and borers have been found on rubber trees of both kinds, white ants have continued to do a certain amount of damage and coconut beetles have had to be regularly collected, but remedies of all kinds have been tried, generally with some measure of success, and the discovery has been made that a decoction of "tuba" roots applied to the base of affected trees is apparently so efficacious that the white ant known as "Termes gestroi' is completely kept under by it. Such a simple remedy, involving as it does only the planting np of an acre or two of this quick-growing creeper, which is easily procurable and equally easily propagated by cuttings, is a most valuable discovery, and there seems no reason why, by continued and intelligent effort, this the worst and most destructive pest known to us at present should not be completely mastere and eventually cease to give ns any trouble.

MANGOES.

If mangoes are not yet the most extensively grown and abundant fruit in Queensland, they soon will be. They thrive vigorously from Southport to Cape York. Almost everyone having a garden goes in for mangoes, but too frequently are regardless of the quality of the fruit, and hence really good mangoes are rare. Some growers realise this, and take all the care they can to plant nothing but the best kinds. Had this been done from the first, Queensland would now be celebrated for her mangoes, aud prices would be more satisfactory. As an evidence of the increasing appreciation of choice fruit by growers, a seedsman has during the last three years realised 2s. 6d. each for some fine specimens. I learnt with regret, at the market, that hundreds of cases had been thrown away this season for want of purchasers. Another, however, told me he had always been able to sell good mangoes. It has been recorded that in some places up North mangoes have been allowed to rot on the ground, the grower being unable to sell or use them. This should not be so, for there are many purposes for which mangoes may be used besides as a table fruit. The following information, in no case original, may prove interesting and useful to some of your readers:—A very delicious preserve is made by simply peeling them when unripe but nearly full-grown; slice, place in a dish, pile on sugar, and bake in a slow oven. When properly prepared this preserve is unexcelled, and would meet with a large demand in Europe and America, as well as the Sontheru colonies. The making of mango jam is well-known to all housewives, its variation in excellence is doubtless owing to the quality of the fruit and sugar, also to the amount of care taken in cooking. The fruit should always be peeled. I am

informed that young mangoes, about the size of olives, make pickle superior to walnuts; if this is so, nothing can be better. In India full-grown but unripe fruit are partially cut through, the kernel removed, the cavity filled with chillies, ginger, and other condiments, then closed and put into vinegar. I do not know whether their yellow colour is imparted by mustard or turmeric. This pickle, which is excellent, is put up in jars of over 7 lb., and also in kegs. Mangoes make excellent sauce, equal to, and by many regarded as superior to, apple sauce. For making chutney mangoes are unrivalled. It is in this direction our pickle manufacturers should do a large trade; all the principsl ingredients are produced in Queensland, and our market is secured to us by an import duty of 4s. per dozen quarts, 2s. per dozen pints, and smaller size in the same proportion. After our own wants are supplied there should be considerable demand for passenger ships. In vessels of the British India and P. and O. I have noticed chutney on the table three times a day: probably this is so in other lines of steamers. Chutneys are made in infinite variety, various grades of hot, sweet, and intermediate. Some of the following recipes may prove useful:—

1st.—Chillies, 1 to 1½ lb.; unripe mangoes, 1 lb.; red tamarinds, 2 lb.; sugar-candy, 1 lb.; fresh ginger root 1½lb.; garlic, ; to ¾ lb.; sultana raisins, 1½ lb.; fine salt, 1 lb.; distilled vinegar, 5 bottles.

2nd.—1 lb. salt, 1 lb. mustard seed, 1 lb. stoned raisins, 1 lb. brown sugar, ¾ lb. garlic, 6 oz. cayenne peper, 4 lb. green mangoes, 2 quarts best vinegar—the mangoes (sliced) and boiled in a quart of the vinegar, the mustard seed gently dried and bruised, the sugar made into a syrup with a pint of the vinegar, the mangoes, sliced and boiled in a quart of the vinegar, the garlic to be well bruised in a mortar. When cold gradually mix the whole, and with the remaining vinegar thoroughly amalgamate them. To be tied down close. The longer it is kept the better it will become.

3rd.—2 lb. of unripe mangoes, peeled and boiled in a pint of vinegar (a strip or two of the skin may be included if flavour wished; 1 lb. onions, finely chopped. In another pint of vinegar boil two lb. sugar (not loaf sugar), 2 oz. ground ginger, and ¼ lb. salt: when cold mix thoroughly and aud 2 oz. yellow mustard seed, ½ oz. red pepper, ½ lb. large raisins stoned, ½ lb. dates, and ½ lb. sultanas, all cut small; keep warm for a month.

4th.—3 lb. mangoes, 1 lb. onions, 1 lb. sugar 1 bottle vinegar, pepper and salt and any spices to taste; boil two hours.

5th.—Green mangoes, peeled and sliced 4 lb.: tamarinds, 1 lb.; sugar (preserving) 1 lb.; salt 1 lb., cayenne pepper, 3 oz.; or chillies (finely cut up) 1 lb. spices, 2 oz; vinegar 3 pints; mix the ingredients thoroughly, and boil slowly for hours.

6th.—50 mangoes, medium size, peeled and sliced ½ lb. preserved ginger, ½ lb. garlic, ¼ lb. chillies 1 lb raisins, 3 lb. sugar, 1 quart vinegar. Make a syrup with the sugar and vinegar, in which the mango must be boiled; when half done put in the other ingredients, mix well, and when thick remove from the fire. Time, one and a-half to two hours. Bottle when cold. I have not tasted any of those recipes, but some have been tried by friends who report favourably. Tastes differ considerably in chutneys; some persons prefer sweet to hot, others the reverse; it may, consequently, be found desirable to vary the proportions of some of tne ingredients.

7th.—12 lb. peeled mangoes, 1½ lb. fine salt, ¼ lb. garlic, 3 lb. raisins, 2 lb. chillies, 3 lb. white sugar; 2 lb. green sugar, 7 bottle vinegar. The mangoes should be turning yellow, but not soft; remove the stone. These quantities are weighed when everything is peeled, and all put through a sausage machine. Boil till a nice brown for about four hours.

8th.—5 lb. green mangoes (weigh with stones in) 2 lb. raisins, ½ lb. mustard seed, ½ oz. red chillies, 1 oz. garlic or onion, 2 lb. dates, ½ lb. green ginger, 1½ lb. sugar, 2 oz. salt, 3 pints vinegar. Peel the mangoes slice half finely, put the rest through the mincer; chop half raisins and dates, put the rest through the mincer; ginger, garlic and chillies well pounded with a little vineger. Boil all for an hour and bottle while hot.

9th.—Peel 4 lb. green mangoes, remove the stones and cut them into quarters lengthwise, boil them slightly in a bottle of vinegar, and put aside in a jar till cold. Take another bottle of vinegar, to which add 2 lb. sugar and boil till it becomes a thin syrup, put aside till cold. Take 1 oz. salt, 2 lb. picked and dried raisins, 1 oz. yellow mustard seed, 1 oz. garlic, 2 oz. dried chillies, I lb. green ginger sliced. Pound the garlic, chillies, and ginger finely in a mortar; mix all the ingredients together, bottle and expose to the sun for three or four days or place in a cool oven.—*Queensland Agricultural Journal.*

RUBBER IN PERAK.

We take the following extracts from the report just issued by Mr. R. Derry, Superintendent of Government Plantations, Perak:—

Para rubber (*Heavea braziliensis*).—The result of a parcel of this rubber sent to London for sale was received early in the year, all the best quality rubber, 327 lb., sold at the rate of 3s. 10d. per lb., and the scrap, 33 lb., at 2s. 6d. The nett proceeds amounted to £61 1s. 6d., or $617·18. I believe this to have been the largest parcel of para rubber sent home from the East. It realised 6d. per lb. more than that sent home in 1898, and was reported on as "para character."

The tapping commenced in March, 1899, and was carried on till July. It was intended to tap a few trees, those which ran most freely, with a view of obtaining the maximum amount of latex without injury, and to obtain about 4—5 lb. from other trees. This much could have been done, but owing to the exceptionally heavy rains which frequently interrupted the work, and in order that the seed crop should not be damaged, tapping was stopped and with several trees long before completed.

The average age of trees tapped is 14 years, taking the yield at 4 lb. per tree, and estimating the trees at at 100 to the acre, this would give a gross return of £73 6s. 8d. at present prices, or at half the price, £36 13s. 4d., and what other tropical product gives the same return? If the trees were only half this age, say 6–7 years, there would not be much difference in the gross result, as then there would be double the number of trees to the acre.

HEVEA BRAZILIENSIS IN PERAK.

At Kuala Kangsar there are two well-marked varieties of Hevea—(1) the typical tree with large leaves attaining 13 inches long and 5 inches wide and generally branching low down; 2) smaller leaves, tall trunk and smaller rather pointed seeds, an inferior variety. The largest tree at Kuala Kangsar is 18 years old and has a girth of 8 feet 6 inches at 3 feet from the ground, this is larger than any observed by Cross in Brazil. Some trees planted by myself 3 years ago have now a girth of 1 foot 3½ inches at 3 feet from the ground. Hevea trees have a short resting season, shedding their leaves about the end of February, their new growth commencing with flowers followed by leaves. It is not uncommon, however, to see trees in September, half or many branches dormant, and without a leaf, while other parts are covered with verdant foliage. The seeds from March flowers commence ripening in August, those from September flowers in February, the heavier crop being in August. Here Hevea trees are planted on dry ground and also low swampy

ground. I have not observed any difference in yield of latex, but I would not recommend land which is liable to heavy floods.

Tapping.—I consider the latex flows most freely when the new leaves appear, which with most Hevea trees is about March, and the advantage of tapping about that time is not so much a question of actual yield as it is of the amount of bark removed in the operation. which would be less at the best season. There would also be another season commencing in September with those trees then flowering. As with all trees, the ratio of growth is variable at different periods, but taking the girth of Hevea trees here, a 3-year-old tree at 3 feet from the ground being 13-15 inches, and an 18 year old tree 100 inches, the annual increment would average nearly 6 inches in circumference, and I am sanguine that Hevea trees can be tapped in Malaya when 6 years old, if not earlier when I estimate the girth at 24-30 inches on good free soil. Tapping should be commenced at the base of the tree, working unwards to 6 or 8 feet if necessary, and f a tree be operated on in a workmanlike manner three annual tappings could be executed before going over old incisions.

COAGULATION.

Samples of rubber prepared at Kuala Kangsar have been reported on as equal to good para (Brazilian) and would fetch best para prices. I have always found the latex to coagulate readily with only the addition of a pinch of alum, and by placing immediately in smoke both putrefaction and mould are avoided. If the rnbber is sound the market value depends on the state of dryness in which it is received. What has been prepared at Kuala Kangsar has been kept smoked until shipped. A parcel sent to London $3\frac{1}{4}$ years ago was reported to have lost $26\frac{1}{2}$ per cent. in washing and the manufacturers thought that if sent home in bulk the loss would reach 30 per cent. This, however, is a question for the planter himself. Smoke has a chemical action in the coagulation of latex from Hevea as well as saving decomposition, and assists in gradually drying. To be as dry as possible depends on the time the rubber has been kept smoked, and I am of opinion that dry marketable rubber could not be prepared under two months. Whether centrifugalisation will prove a practical method with Hevea is still in its infancy. I understand that the globules of *caoutchouc* in the latex of Hevea do not separate readily, as is the case with some other latices, and owing to its chemical combination the latex of Hevea will be probably best prepared by the natural method.

RAMBONG.

India rubber (*Ficus elastica*).—A sample of $5\frac{1}{2}$ lbs. was sent to London, with the para parcel, for sale and opinion. It was reported on as "good clean Java character" and valued at 3s. 6d. per lb., but sold for 3s. 10d.

The largest tree at Kuala Kangsar is about 90 feet high, measures 88 feet and 3 feet from the grou id, measuring round all the aerial roots, the branches extend to 36 paces, and the largest leaves are 13″ × 7″, its age 19 years. The growth of this tree has been remarkable during the last three years, from he time its aerial roots reached the ground.

Ficus elastica is an indigenous tree, found in Upper Perak. It is naturally an epiphyte, and its growth would be no doubt assisted if planted at the bases of felled trees. Its growth is slow at first but rapid when well established. Considering the enormous dimensions this tree attains, 10 to the acre would be close enongh planting and as perhaps 8 years would have to elapse before the tree could be profitably tapped the intervening spaces could be utilized by some other crop, even Hevea, which would be beneficial to the growth of the *Ficus*.

YIELD.

I have not any information as to the age when *Ficus elastica* conld be profitably tapped. At Kuala Kangsar there are two trees 12 years old, and two 19 years old; from the latter 25 lb. of rubber has been obtained from each tree, and the tapping was far short of being exhaustive. The result of the other trees has not yet been ascertained, bnt I expect good results.

Getah Singret (*Willoughbeia firma*). A small sample was sent to London with the Para parcel, and reported on as "good strong Borneo character," valued and sold at 2s 6d. per lb. This is the best of the indigenous creepers, but I doubt very mnch if it ordinarily reaches the European market in a pure state, being usually used to adulterate getah percha.

Getah Taban Sutra (*Dichopsis*) *gutta var.* There is one example of this tree in the Kuala Kangsar garden which is said to be 17 years old, and fruited for the first time in November, 1900. A few herbarium specimens were obtained, all the other fruits being carried off by squirrels before being ripe. The height of this tree is 25 feet, and girth 2 feet at 3 feet from the ground; a jungle tree growing under heavy canopy wonld of conrse be much higher, with less branching habit and smaller girth.

Central America Rnbber (*Castilloa elastica*).—Abont 150 seedlings of *Castilloa* from Ceylon seeds have been raised. It appears doubtful, however, whether the Ceylon trees are *Castilloa elastica* (true) or only an inferior variety, *Castilloa Markhamiana*, the results of the Ceylon trees being far below South American returns.

Getah Percha (*Dichopsis polyantha*).—A variety of getah percha which grows from near the foot of Larut hill to 3,000 feet. A mountain form may prove valuable for planting on high land. None, however, was observed in fruit, and it presumed that with this tree, as with many indigenous trees, a fruiting season only occurs once every few years. Seedlings are abundant bnt the smallest seem two years old.

THE DATE PALM FOR QUEENSLAND.*

BY T. MORRIS MACKNIGHT, F.L.S.

[Read at a meeting of the Natural History Society of Queensland, on 1st November, 1894]

WHY NOT FOR NORTHERN CEYLON?

The date palm is an example of extraordinary fruitfulness. Next to the coconnt it is nnqnestionably the most interesting and useful of the palm tribe. Without it the desert would be uninhabitable. Do we not understand, then, the gratefnlness of the Arab towards a tree which can derive its nourishment from the scorching sand, and scarcely less burning airs of heaven, and the brackish waters beneath the soil, which are fatal to all other kinds of vegetation; which retains its verdnre fresh in the glare of a pitiless snm; which provides him with beams and coverings for his tent; cordage for the harness of his horses and mnles; fruit to satisfy his hunger? What the vine is to the Italian, the coconut-tree to the Polynesian, the date palm is to the Arab. And more—far more. This single tree has peopled the desert. Without it the tribes of the Sahara would cease to be. The wealth of an oasis is oomputed by the number of its date trees.

* The author prefaced his paper with the statement that he made no pretence of having an expert knowledge of his subject. He had collected information from all the sources which were available to him, and had given the matter his consideration for some time past. The resnlts of this compilation he submitted as a guide to those in search of summary information on the subject.

HABITAT.

The habitat of the date is North Africa, Arabia, Persia, Egypt, Nubia, Syria, and it does not go further east than the mouth of the Indus. It is indigenous in the Canary Isles; wanting in the south of Senegal, and it no longer appears in the Oasis of Darfur, between the 13th degree and 15th degree of latitude. The zone in which it grows well in general is that between 35 degrees and 19 degrees north. According to Link (Die Urwelt., I., p. 347), it flowers freely in the south of Europe, as in Sicily, the Morea, and the south of Spain: and also bears fruit there, though this is not sweet. In Sicily it still grows at 1,700 feet—namely, at Aderno and Trecastagne on Etna, but it probably does not bear fruit on this island (Philippi on Vegetation of Etna, 'Linnæa,' vol. 7, p. 731). It needs 5,100 degrees Fahr. of heat accumulated during eight months for the date to ripen its fruit perfectly. If the sum of the heat be less, the fruits set but do not grow to their full dimensions; they also remain bitter to the taste, and lack much of the sugar and albumen, to which they owe their nutritive properties. The requisite conditions are realised in the Sahara. The mean temperature of the year there averages from 68 degrees to 76 degrees, according to the locality. The heat commences in April, and does not cease till October. Keith Johnston's 'Physical Atlas' gives the temperature in summer and winter as—July, 81 degrees to 86 degrees; January, 52 degrees to 61 degrees; mean temperature (annual), 68 degrees to 76 degrees. Biskra, the celebrated date-growing district in North Africa, is in latitude 34 degrees 51 minutes, altitude 410 feet: it faces towards the hot tropical south, and is protected by mountains on the north side. It has an annual mean temperature of 68·5 degrees (January 50·2 degrees, July 89·8 degrees). The thermometer seldom sinks in the cold season more than 2 degrees below freezing point, and the date can endure 6 degrees of frost.

The neighbourhood of the sea is unfavourable to the production of good dates. The general altitude of the central districts of North Afric·, where it thrives, is 600 feet to 2,000 feet; the date palm also grews in some Egyptian oases from sea-level to 600 feet. The lower portions of the Rivers Euphrates and Tigris in Turkey are from sea-level to 600 feet.

The amount of annual rainfall requisite for the best dates is from 5 inches to 10 inches; for those of inferior qualities, from 10 inches to 25 inches. Mr. A. S. White, secretary the Royal Geographical Society of Scotland, gives, in his work, the 'Development of Africa,' 1890, a map of the rainfalls in North Africa, Arabia, and Persia, which may be profitably referred to in this connection. Although the date requires a hot, dry climate, yet its roots must have access to moisture. And though it is essentially a tree belonging to desert regions, yet it is confined to the oases in these deserts where water is found. It flourishes in rainless countries, but only where there is moisture in the soil, either naturally or produced by irrigation.

IRRIGATION AND OASES.

The 'Oases of the Tableland,' writes Charles Martins, in his 'Du Spitzberg au Sahara,' 'are each watered by a stream or copious spring, and are but a short distance from the Mediterranean region. The oases of El Kantara is the first (Mangin) we met on leaving the Mediterranean region to penetrate to the Sahara through a ravine called the 'Mouth of the Desert.' It is 1,800 feet above sea-level, and its temperature just suffices to enable the dates to ripen. The oases of the Valleys of Erosion are watered by natural or artesian wells. An example is Ouargla, situated in a profound hollow. The palms are planted at the rate of 1,000 to 1,100 a hectare (2¼ acres). Outside the gardens grow some wild date palms, which yield a smaller crop, but whose fruit is much more savoury. The oases of the Sandy Desert need water. The trees are here planted in conical cavities hollowed by the hand of mango, that their roots may strike down to the subterranean reservoir which is to nourish them. These cavities are 18 feet, 25 feet, or 30 feet deep. The slopes around these hollow gardens are stayed indifferently well by a matting of palm-leaves. The wells are in the centre, and not deeper than 25 feet. These oases have a very precarious existence, as a gust of wind may bury them under an avalanche of sand. Every oasis is composed, in the main, of palms which seem to form a continuous forest; but in reality they are planted in rows and in gardens separated from one another by walls of earth, which are pierced with an aperture to admit of the entrance of the irrigating rill into the enclosed square. The soil employed in the construction of the walls is removed from the paths, which are consequently below the surface, and can be employed for a double purpose: they facilitate circulation in the oasis, and the waters, after having refreshed the gardens, discharge themselves into these hollow ways.

SOIL.

Meyen, in his 'Geography of Plants,' page 2, states that a sandy soil suits the date best; and Sonnini, in his 'Travels in Egypt,' saw it growing in the sands as well as in the more fertile parts. It will luxuriate even in saltish soil, and the water for its irrigation may be slightly brackish. The artesian water of the Oued Rir district in Algeria contains from 0·57 oz. to 1·07 oz. of dry salt in a gallon. Brigade-surgeon Bonavia says that on the whole it thrives best in sandy, granitic, schistic, and calcareous soils. The nothern half of Arabia, which is an important centre for date culture, is granitic.

INFLORESCENCE.

The date is a diœcious tree, having the male flowers on one plant and the female or fruiting ones on another. The male flowers are considerably larger than the female, furnished with stamens only, and form a closed-up, folded, grape-like ball (previous to the ripening of the pollen) in an envelope called the spathe. 'It blossoms,' says Mr. Tristram, in his book 'The Great Sahara,' 'in the month of March. The male flower is borne on a very short calyx, a thin petalous corolla much larger, with six stamens, furnished with long linear anthers, the two cells of which open themselves from within by two longitudinal slits. The female flowers present a double floral envelope, each whorl of which is formed of three pieces, constituting three distinct pistils, each surmounted by a stigma in the form of a hook. Of these three pistils one only develops itself, ripens, and becomes an elongated ovoid berry, with a slight epidermis of a yellowish-red, a solid and slightly viscous pulp, and an endocarp represented by a slight pellicle enveloping the nucleus, which is the seed. The seed is grooved, and on the opposite side of it is a depression containing the germ." Baron Mueller states that one male tree is considered sufficient for fifty females. Watts allows one or two males to from eighty to two hundred trees.

PROPAGATION.

The best trees are produced from suckers from three to four years old, having an average weight of about 6 lb. Those raised from seed are much slower in maturing, and are generally poor. The sucker is taken from the foot of the stem of an adult tree: when first planted it must be watered daily for six weeks, and on alternate days for another six weeks, after which the trees are watered once a week in summer, and every month in winter. The nut does not commence to germinate until from six to twelve months after planting have elapsed, and grows very slowly for the first two years. The trees yield fruit in from five to six years, and are in full bearing at from twenty to twenty-five years, after which they

continue fruitful for about 150 years. Several bunches of flowers are formed in a season, each producing often as many as 200 dates. Select trees are reported as having borne a crop worth £2, but the average may be put down at 4s. per tree annually, common kinds less than 1s. A good date tree is sometimes exchanged for a camel in North Africa.

FECUNDATION.

"In Algeria and all over the East," says M. Cossona, a botanist who has studied the subject on the spot, "towards the month of April the tree begins to flower, and then artificial fecundation is practised extensively. The male spathes are opened at the time when a sort of crackling is produced under the finger, which indicates that the pollen of the flowers in the cluster is sufficiently developed, yet has not escaped from the anthers; the cluster is then divided into portions, each containing seven or eight blooms. Having placed these pieces in the hood of his burnous, the workman climbs to the summit of the female tree, supporting himself by a loop of cord passed round his loins, and at the same time round the trunk of the tree, and, having split open the spathe with a knife, he slips in one of the fragments, which he interlaces with the branches of the female cluster, the fecundation of which is made certain." Archer says that wild plants are fecundated by bees. The Arabs even keep the pollen from one year to another in case the male flower should fail the succeeding season. According to Watts the pollen is said to remain active for one or two months after its removal from the tree, so the flower is carefully kept and used as occassion demands. Hasselquist, who travelled in Egypt, describes the operations as follows:—"When the spadix has female flowers that come out of its spathe, they search on a tree that has male flowers, which they know by experience, for the spadix has not yet burst out of its spathe. This they open, take out the spadix, and cut it lengthwise in several pieces, but take care not to hurt the flowers. A piece of this spadix, with male flowers, they put length-wise between the small branches of the spadix which has female flowers, and then lay the leaf of a palm over the branches. In this situation I yet saw the greatest part of the spadices which bore their young fruit; but the male flowers which were put between were withered. The Arab also stated that unless they in this manner wed and fecundate the date-tree it bears no fruit; secondly, they always take the precaution to preserve some unopened spathes, with male flowers, from one year to another, to be applied for this purpose in case the male flowers should miscarry or suffer damage; thirdly, if they permit the spadix of the male flowers to burst or come out it becomes useless for fecundation; therefore, the person who cultivates date trees must be careful to hit the right time of assisting the fecundation, which is almost the only nicety in their cultivation."

To climb trees which have no branches but at the top, and the straight and slender stem of which cannot support a ladder, the Egyptians employ a sort of girth fastened to a rope that they pass round the tree. On this girth they seat themselves and rest their weight; then, with the assistance of their feet, and holding the cord in both hands, they contrive to force the noose suddenly upwards so as to catch the rugged protuberances with which the stem is symmetrically studded, formed at the origin of the branch-like leaves that are annually cut. By means of these successive springs the top of the tree is reached where, still sitting, they work at their ease, either in lopping off the leaves or gathering fruit, and afterwards descend in the same manner.

Professor Burnett says the age of bearing is from six to ten years. Haldane says seven years. Baron Muller says that trees from suckers commence to bear in five years and are in full bearing in ten years.

The fig, pomegranate, and apricot, and sometimes the olive, are grown as auxiliary crops. I would suggest also the watermelon, pumpkin, vegetable marrow and lucerne.

VARIETIES.

Dr. James Richardson in a letter in "Hooker's Journal of Botany," Vol. II., writing of the dates of Fezzan, describes forty-six varieties. Nineteen-twentieths of the inhabitants of Fezzan during nine months of the year live on dates. In Northern Arabia there are more than a hundred kinds of dates, each of which is peculiar to a district, and has its own special virtues. Many varieties of date exist, differing in shape, size, and colour of the fruit. Those of Gomera are large, and contain no seed. The Zadie variety produces the heaviest crop, averaging in full bearing trees 300 lb. to the tree. Professor Naudin states that the variety of "Datberessifia" ripens its fruit early in the season. The "Deglet Nour" is considered the best for keeping.

TREATMENT OF FRUITS.

Four or five months after the operation of fecundation has been performed the dates begin to swell, and when they have attained nearly their full size (about the beginning of August) they are carefully tied to the base of the leaves to prevent them from being beaten and bruised by the wind. If meant to be preserved they are gathered a little before they are ripe, but when they are intended to be eaten fresh they are allowed to ripen perfectly, in which state they are very agreeable and refreshing. Ripe dates cannot be kept any length of time or conveyed to any great distance without fermenting and becoming acid, and therefore those which are intended for storing up, or for being carried to a distant market, are dried in the sun on mats. They are sent in this way to Europe from the Levant and Barbary. Each tree is capable of yielding only a certain number of good fruits, and on adult trees not more than twelve bunches are left to ripen. The whole cluster of fruit is cut before it is quite ripe, when it is put into a basket made for the purpose, having no other opening than a hole through which the branching extremity of the cluster projects. In this situation the dates ripen successively.

In the Hedjax (which is the northern half of Arabia) the new fruit called *ruteb*, comes in at the end of June and last two months. The people cannot therefor depend on the new fruit alone, but during the ten months of the year, when no ripe dates can be procured, principally subsist on date paste, called *adjoue* which is prepared by pressing the fruit, when fully matured, into large baskets. "When the dates are allowed to remain on the tree till they are quite ripe, and have become soft and of a high red colour, they are formed into a hard solid paste or cake called *adjoue*. This is obtained by pressing the ripe dates forcibly into large baskets, each containing about 2 cwt. In this state," continues Burckhardt, "the Bedouins export the *adjoue*, and in the market it is cut out of the basket and sold by the lb. During the monsoon the ships from the Persian Gulf bring *adjoue* from Bussorah to Djidda for sale in small baskets weighing about 10 lb. each; this kind is preferred to every other."

The date seeds or kernels are soaked for two days in water, when they become softened, and are given to camels, cows, and sheep instead of barley. There are shops in Medina, in Arabia, where nothing else is sold except date kernels, and the beggars are continually employed in all the main streets in picking up those that are thrown away.

The best fruit is that which is gathered just before it is ripe and exposed to the sun for several days to mature. The crushed dates which arrive in England in bulk are inferior and damaged, having ripened on the trees and fallen. I have seen some beautiful dates in London on the stalks. These, in the same way as raisins, have the short

pedicels left on them. Then, again, I have seen, in Port Said dates, prepared somewhat as we often see them in shops in Brisbane, sold very cheaply, being, I suppose, the refuse of the date groves pressed into a paste or soft mass. This is sold by weight in chunks. In Egypt, the dates of Upper Egypt and the Oases are those which are the most delicate. The hotter and drier the climate the richer is the date, and near the coast the poor fruit is fit only for animals, as mentioned in "French Colonies," by Bonwick, 1886.

MISCELLANEOUS.

Tunis has 2,000,000 date trees; Egypt, 4,000,000; Bussorah, in Turkey, has enormous date groves stretching along both banks of the Euphrates for a distance of over 140 miles, yielding 40,000 tons in good seasons.

The price in England in March, 1894, was—Bussorah (boxes) 9s to 13s 3d per cwt.; Tafilet, 44s to 50s per cwt.

Dates contain more than half their weight in sugar, but there is a fair amount of flesh-forming material present as well. Dates, without the stone, contain in 100 parts—

Water	20·8
Albumen	6·6
Sugar	54
Pectose and gum	12·3
Fat	0·2
Cellulose	5·5
Mineral matter	1·6

The pungent rigidity of the foliage protects the date from encroachment of pasture animals; hence it can be left without fencing or hedging.

QUEENSLAND AS A DATE COUNTRY.

I have now given all the general information I can find in regard to the cultivation, &c., of the date palm in North Africa, Turkey in Asia, and Arabia. It will be convenient now to see if in Queensland similar conditions of temperature, &c., can be found. The part of Queensland which, bearing in mind the requirments of the plant already set forth, seems to be the most suitable for the cultivation of the *best* dates is to the west of Hughenden, Longreach, and Charleville, and from latitude 23 degrees to the southern border of the State. The following remarks all refer to this area:—

TEMPERATURE.

Comparing the region of Queensland which includes these places, with Biskra, in North Africa, in latitude 34 degrees 51 minutes at an altitude of 410 feet, we have—

	Queensland.	Biskra.
Annual average temperature... ...	67·74	68·5
Mean temperature, coldest month ..	48·61	50·2
Mean temperature, hottest month ...	84·90	89·8

I do not know the extreme minimum temperature at Biskra, but the lowest in the part of Queensland above referred to is 26·4 degrees at Boulia in July, 1894. My information for Queensland is obtained from the Meteorological Reports, which are only available from 1st September, 1893, to 31st August, 1894. I believe this last winter was considered a very cold one throughout the colony, and as the date palm can stand as low a temperature as 26 degrees it should be safe even at Boulia from being killed by forst. The latitude, 20 degrees S. to 27 degrees S., also indicates generally the area in which the suitable temperature is to be met with.

RAINFALL.—In the above possible date-growing belt of Queensland the rainfall ranges from 5 inches to 24 inches, and in the more westerly portion this reaches the minor limit, therefore improving the quality of the date on account of the greater dryness of the air combined with the circumstance that there is greater heat also.

ALTITUDE.—Looking generally at West Queensland, the rivers and creeks all run to the south-west, showing that the higher ground is the north and east. Then there are high downs between the Gulf of Carpentaria waters and the Diamantina and Thomson Rivers; so that all this higher ground must vary from 600 feet to 1,400 feet above sea-level. But to the south-west of Boulia and Windorah and to the south of Thargomindah and Charleville the altitude of the country is from sea-level to 600 feet. From the above figures it can easily be seen where there is the least likelihood of frost.

SOIL.—The geological formation in the region indicated is mesozoic, with desert standstone on the higher ground between the various watersheds, and lower cretaceous on the plains and downs. As apparently the date palm prefers a sandy soil, the conditions in this case seem favourable also.

From the above data it will be seen that West Queensland is generally suited to the cultivation of the best dates. As to the local conditions, they must be ascertained by Queenslanders themselves. The object of this paper is to give to the State the information in regard to the date which is scattered throughout many books and is not easily obtained, and also to suggest the best place for initiating experiments in date cultivation in this country.

[We are indebted to Mr. Hy. Tryon, Government Entomologist, for the foregoing paper.]

ZANZIBAR PLANTING INDUSTRIES.

COCONUTS.

What return will a coconut tree bring in per annum? The average yield of nuts in Zanzibar island is probably from 25 to 30 per tree. Calculating the price at R20 per 1,000 on the spot and the yield at 30 we get a gross return of 9 3-5 annas per tree. Gathering may be set down at R4 per 1,000, which leaves a net return af about 7½ annas, or half a rupee, per tree. Pemba trees yield less than Zanzibar; the average is probably less than 15 nuts per tree per annum. Labour is cheaper and the cost of gathering less than in Zanzibar: about R3 per 1,000. The net return per tree works out to about 4½ annas per annum in Pemba. Mr. J. T. Last, F.R.G.S., writes as follows upon the benefits of cultivation as he has found them at Mangapwani:—

"There are at Mangapwani abont 200 bearing palms from which the nuts are gathered every three months. About three years ago I had the ground well dug up for some 6 feet round the base of each tree, and then packed round the tree any manure, grass or decayed vegetable matter I could get, covering the same up with soil. This has been repeated every year. The result of these operations is that the number of nuts gathered is greatly increased.

Formerly the three-monthly gatherings would average about 3,000 nuts, now more than double that amount is obtained. The last gathering reached the number of 7033. Since I started mulching the trees there have always been one or more trees at each 3-monthly gathering from which I obtained 100 nuts.

At the above gathering from

1 tree are gathered		110 nuts	
2 trees ,,	,,	100 ,,	each
1 tree ,,	,,	91 ,,	
1 ,, ,,	,,	89 ,,	
1 ,, ,,	,,	86 ,,	
1 ,, ,,	,,	80 ,,	

Making from 7 trees 556 nuts.

I think, judging from the above results, we could fairly expect that, with proper attention, a healthy full-grown coconut tree would produce 100 nuts a year.'

We find at Dunga that individual trees occassionally yield close on 100 nuts at a gathering, though we have

not found such good general results follow upon digging and mulching as Mr. Last has at Mangapwani. Our trees have all been dug and mulched but the average yield of nuts remains about the same, though we are, looking for some improvement this year. Our trees are scattered about through enveloping native villages, and the nuts are consequently exposed very much to theft. Loss by theft is the greatest evil cocoanut planters have to contend with in this country.

PLANTING THE NUTS.

Natives plant nuts on their sides and sometimes in an upright position. They declare that in the latter case a stronger plant is obtained. Dr. Krapi in his Swahili dictionary has the following note :—

"The natives plant the coconut (which is to become a tree) on the fourteenth day of the moon, because the moon is then at her full power. This takes place before the rain. They put it into the ground without removing the husk, taking care that the *mte* or bud is placed downwards in the pit, which they dig to the depth of one *mukono* (cubit). The tree (like the mango-tree) requires five years' growth before it bears fruit. . . . . . The Wanika consider the coco-tree to be their mother on account of its usefulness, Therefore they will not allow it to be cut down. They believe that a *koma* watches over it, Therefore when the tree yields no *tembo* they endeavour to appease the *koma* by a sacrifice. On this account they place a coco-shell on the grave of the dead, and fill it with *tembo* from time to time, in order to induce the *koma* to give them much *tembo*. The Swahili cut down the coco-tree without scruple."

The generally accepted way of planting a nut is to lay it on its side in a trench about 7-8 inches deep (its own depth.) It has been rightly pointed out that if a nut be planted eyes downwards, the young shoot may rot before it reaches the surface ; on the other hand if planted eyes upwards the milk inside, which is especially provided for the first nourishment of the germ, will settle at the bottom of the nut and the young shoot will then run a risk of being dried up. Nature seems to have especially pointed both ends of the nut so that, having fallen from the tree it shall remain upon its side to germinate. In the case of the mangrove the young seedling drops from the parent treo upon its pointed end and sticks in the mud and grows forthwith. But the bottom of the coconut could not have been pointed to enable it likewise to stick in the sand and germinate, because a nut always falls upon its side. This is well shown by dropping a few nuts from the roof of a high house. If the nut is suspended by the stalk, in the way it hangs upon a tree, and dropped, it will turn half over and fall sideways. The same thing happens if the nut be held upside down. If it be held horizontally, it will maintain this position till it reaches the ground. Nature is always a safe guide. Allow a space of nine inches or a foot between the nuts in the trench, and 18 inches between the trenches. This gives plenty room to lift the nuts when the time comes for them to be planted out, without doing much damage to the roots. April is the best time to plant out the seedlings, when they should be 5 or 6 months old. Hence the nuts should be planted in the nursery in November. But no hard and fast rule need be laid down, especially as our seasons are uncertain. 35 feet by 35 feet is a good distance for them to be placed in the plantation. This gives 35 trees to the acre.

ESTIMATE OF THE NUMBER OF TREES.

Coconut trees are scattered about so promiscuously that it would be almost impossible to arrive at the accurate number of trees on the islands. The average annual amount of copra exported from these islands during the last six years has been 6,519,216 lb. Counting that 2 nuts make 1 lb. of copra, this would be the product of 13,038,432 nuts. Probably as many nuts are consumed as food as are made into copra. If so the total average yield of nuts is 26,076,864. This is the product of about 1,000,000 trees. If these trees were growing in regular plantations 35 feet apart they would cover an area of 28,571 acres.—"*The Shamba*," *Journal of Agriculture for Zanzibar.*

WALKING STICKS.

Messrs. Howell & Co., Old Street, London, have kindly supplied us with the following points to be observed in collecting walking sticks :—

Length.—The total length should not be less than 42 inches, end to end, but if possible they should be 48 inches.

Size.—The best sizes are of the diameter of ¼ in to 1-in., measured about *midway* ; they should not be larger than 1¼ inches in diameter.

Form.—It is indispensable that the diameter should gradually diminish from the root or handle to the point, so that the stick is not " top heavy."

Handle.—It is always better, when possible, to send sticks with some kind of handle ; if the plant be pulled up, the root should be left quite rough and untrimmed if a branch be cut off, a part of the parent branch should be left on to form a knob or crutch handle.

Sticks without Handles.—Sticks without handles can be used, especially if they are nicely grown, and have any peculiarity of structure or colour—but if there is any handle, however small, it should not be cut off. Young saplings of the different kinds of Palms, Bamboos, &c. should always have the root left on.

Short Handles.—Occasionally, the form of the root or handle part is attractive, while the stick itself is weak and defective, in such cases the handles only should be sent, and they should measure from 15 to 18 inches in length.

Send only Specimens in first Instance.—In sending specimens of new sticks, it is better to send only small quantities, say, 1 or 2 dozens at most of each kind, then if approved, further quantities can be asked for.

All kinds of wood.—Specimens of anything remarkable for form or colour, whether in the Roots or Stems, of Woody, Herbaceous, or Reedy structures should be sent, as sometimes the most unlikely things are found to posses value, for use either as Umbrella Handles or Walking Sticks.

Details/—Details as to quantity to be procured prices. &c., should be sent, if possible.—"*The Shamba*" *Journal, of Agriculture for Zanzibar.*

RUBBER IN PERU.—The German Consul in Payta-Piara (Peru) reports the discovery of large rubber forests on the Niera River, a branch of the Amazon, which can be reached from the middle of the tobacco plantations by an eight-days journey. Several German firms organised a large expedition to start for the interior and to secure the rights to collect the rubber. As the natives are very poor, it is expected that cheap native labour will facilitate the collection.—*Engineering.*

SUGAR IN HAWAII.—Regarding the possibilities of the cultivation of sugar cane in the Hawaiian Islands, Prof. Stubbs said the soil was the best in the world for the cultivation of cane, being superior to that of Cuba. The yield on the arid and irrigated lands of the islands is from eight to fifteen tons of sugar per acre, while in Louisiana the yield is about 1½ tons per acre. But about all the available lands having been taken up in the cultivation of cane already, the increase of production cannot far exceed the present output. The total value of the agricultural produce of the islands is about $20,000,000, of which $17,500,000 is to be credited to sugar. Thus it will be seen that the islands have already reached, or nearly reached, the limit of yield. The drawbacks to the cultivation of cane in these particularly favored islands are the high price of coal—which reaches as high as $12 per ton—the cost of irrigation and the great cost of sugar house plants. Nevertheless, the profits are so large as to practically preclude the cultivation of any crop but cane.—*Louisiana Sugar Planters' Journal.*

PLANTING FRUIT TREES.

There are planters and planters. The first digs out a small hole in hard, unmoved ground, and thrusts in the roots about as deep again as they ought to be; the earth is filled in and the planter passes on under the impression that he has done a good thing—for himself perhaps—but certainly for posterity. Such comfortable feelings are all very well, and we would be the last to say a word that would deter anyone from indulging in tree planting, but the subject demands that sentiment has no place in this connection. We are bound to look at it in a practical light. Trees that are improperly planted never do well, therefore the inexperienced do not meet with the result their good intentions deserve. The moral, therefore, is that only those should engage in planting trees who are practically acquainted with the work. Before we go further let us dive a little deeper into the behaviour of trees which have been unskilfully planted. The first year they make no progress; they live, and that is all that can be said about them. The next year they do a little better, but the growth is not so strong as it ought to be. In succeeding years moss and lichen begin to accumulate on the stem and branches, the result of the beneficial influence of sun and air. Trees in this condition from such a cause do not die, but at best they are short-lived as compared to those that were planted in a proper manner. Nor is the crop of much value; invariably such trees bear irregular crops of small and badly-formed fruit. Let us now look at the behaviour of the trees which are planted by experienced hands. In the first place the cultivator makes his anxiety manifest to do the planting well by making himself acquainted with the character of the land. If it is of a retentive nature, with a heavy subsoil, he is careful to have the position efficiently drained. If the soil is poor, it will be enriched with manure: but, more than all, he will avoid planting a young tree in a spot from whence an old one has been removed. If he does so, the old exhausted soil is taken away and fresh soil put in its place; but to avoid the labour attending the latter plan a fresh position altogether is selected, which in the end will be more satisfactory than supplying fresh soil to an old position.

The Depth to Set the Roots.—In every case the careful planter will study to plant his trees in ground that has been well moved up 18in. or 2ft. deep. If the whole of the space is not trenched over, then most of it must be, so that the roots have, for the first year or two at least, some recently-moved earth to feed upon. This is not all that the experienced man does. He will not plant a tree more than a few inches below the surrounding level on land that is liable to get water-logged in winter. In some cases he will plant altogether on the surface, and place a mound of soil over the roots. This plan has much to recommend it where there is not sufficient depth of good soil, as it gives the roots all the room there is of good earth; but it is not advisable to plant on the surface on light gravelly land. Such, then, are some of the differences between men who have experence in this matter and those who have not. We have not drawn upon our imagination to prove a case. We, and many others, have long been familiar with such mistakes in planting, and have seen both time and money wasted; but in all probability more trees are crippled through deep planting than from any other cause. Some cultivators of fruit purposely plant the roots deeper than they otherwise would do under the impression that the trees are not so easily blown down when they get old. A very little reasoning ought to convince anyone that they are under a mistake. To bury the stem of a tree more than 6 in. under the surface is an error that will speedily show itself in its after behaviour. This is a fact that has been demonstrated in practice many times during our experience, where people in making alterations have, when excavating out the soil for a road, buried up the stems of trees 2ft. or more in height rather than remove them altogether. The result has always been that the trees so dealt with died in a few years. We therefore maintain that, if old trees suffer by having their roots too deep, young ones would also suffer in a proportionate degree.—The "Fruit Grower," London.

PRUNING.

By H. CONSTANTINE THOMAS, JAMAICA.

Pruning, from an agricultural point of view, may be briefly defined as regulating growth, cutting away all superfluous growth for the benefit of a tree or its fruit. Pruning is one of the most delicate and yet important branches of agriculture; not even a leaf should be cut off a plant unless the operator has some definite object in view; ignorantly performed, its injurious effects do not hesitate to manifest themselves, such as taking a cutlass and chopping off a branch from a cocoa tree a foot from the stem, the piece left on starts decaying, and this process continues right into the main stem itself, and often results in the death of the tree. On the other hand, when carried out intelligently by individuals who base their practice on the laws governing végetation, regular symmetrical growth, production of well developed leaves, branches and fruits are secured. The beneficial results of pruning, done at the proper time, and in a proper manner, are too numerous for enumeration here, but I mention a few. By pruning, all the fruit-bearing branches of a tree are fully exposed to a free access of air and light: two things that are absolutely indispensable for the successful culture of plants. Leaves are the digestive organs of a plant, and should not be destroyed wilfully. The best season for pruning is a question of great importance, since the conditions under which the plants to be pruned are placed act such a prominent part, but under ordinary environments I think the best season is nearly the end of the dry season, just prior to the heavy rains, which in most of our districts can be correctly guessed. The implements are a pruning knife, a pruning saw, a pair of shears, and, in case of large trees, pole-pruning shears or a tree-pruner. The wounds must be smooth, *i.e.*, after using the saw take the knife and smooth off the surface well; the benefit derived therefrom is that it renders their healing easier, quicker, and with less strain on the plant. After having smoothed the surface of a wound it is also beneficial to rub it over with a little tar. This is a very useful antiseptic and is retailed at a very reasonable price.

Pruning at the time of transplanting is very technical. If citrus plants for example have to be transplanted during the dry season all the leaves must be carefully removed, as in such a case they would help to kill the plant by letting off all the moisture they contained; if it happens to be rainy they are to be left. Citrus trees require very little pruning after they are established; once in two years, and that slightly, is enough; in such cases the operator should confine himself chiefly to the removal of dried twigs. Some plants need constant and regular pruning; the cocoa for example. It is quite an ordinary thing for people to plant out "at stake" and never look after the plants from the day they discover that the seeds have grown until they are bearing. This plant naturally sends out branches as soon as it has reached the heigh of three or four and a half feet under favourable conditions; when shaded excessively it grows a long, spindly stem, often branching when entirely out of easy reach, and since climbing is detrimental, it is best to grow the plants so that the fruits can be obtained more easily; in climbing the flower-buds are rubbed off, thus lessening the next crop. I cannot deal with the general culture of the plant here, so returning

to my subject—pruning. Let me say that when the trees have put out these branches all should be taken away when young, save three, which three must form the best triangle and left to develop into the three main branches. These branches also send out secondary ones; these secondary branches must not be left to grow on just as they came out, but care must be taken to remove every alternate one, leaving, on an average, eighteen inches between each. Gormaudizers (or suckers as they are sometimes called), always block out air, use up a lot of valuable plant-food and give, comparatively, nothing in return. The tree should be kept clear of these. My difinition of a gormandizer is a shoot springing from the stem of a plant, going straight up, and in the case of the cocoa, particularly, giving little or no return, thus wasting what would be profitably used by the true branches of the plant. I do not want to be called a critic, as I opine that, to-day, we have more agricultural critics than agriculturists; still the present system of plucking off the pods from the cocoa-tree is abominable. The flowers are produced chiefly on the stem of the fruit (the peduncle) and when the fruits are torn off, apart from the destruction of the bark of the parent-plant, the crop is greatly reduced the following year, so I would recommend people gathering the pods to use a knife and cut off the fruits; several little rings or marks will be seen on tho peduncle, cut the fruit in the third one from the stem. With regular pruning this plant will yield two heavy crops annually; one about June and another in December. The time has come when all useful details must be brought out, "Experience teaches wisdom." Let each of us mention our experience, not thinking what the next man will say, and our fellow-men may benefit therefrom.—*The Journal of the Jamaica Agricultural Society.*

THE PAPAW TREE.

"Forester" writes to the *Indian Planters' Gazette*:—This fruit tree, the Carica Papaya, Willd, is cultivated all over India for its fruit, which is eaten in its ripe state as well as cooked and used in curries when green. They can also be pickled and made into preserve. If the Linnæan sexual system wanted any additional proofs of its being established on the most solid foundation, Roxburgh's experiment with this plant would have furnished a very strong one. The writer recently had occasiou to consult his mukhtear on some business and noticed some very fine papaya fruit commenciug to ripen in his compound. Upon remarking that they would be much better if thinned, he was informed that previous to some more trees being brought from a neighbouring compound about half-a-mile away they never grew thickly and what did grow were small and of little use in comparison with the fruit he had been getting since. Of course the reason was obvious enough. He had only one tree to start with and that was a female, and the trees he got from a neighbour were a mixed lot containing both sexes. When this was explained the man of law was incredulous; he had never heard of such a thing as a sexual system belonging to the vegetable kingdom, and was very much inclined to think that he was being humbugged. It must be said for him that he had some reason for doubting tho truth of what was being explained to him, as he had somewhere or other seen the male tree fruiting. A Chittagong friend of the writer's informed him that he had male trees which regularly fruited. Some specimens of the male tree with fruit on them were shown to Dr. Roxburgh in 1793 by Sir William Jones. Dr. Roxburgh had never seen the male tree bearing fruit, and it was the only instance that had come to his knowledge where female or hermaphrodite flowers were found on the male papaya tree. It is said that the fruiting of the male tree is common enough in some districts. There is nothing impossible about it, as, if the male flowers are carefully examined, they will all be found to be possessed of female organs, although as a rule they are merely rudimentary. The papaw tree, although usually looked upon as diœcious, perhaps would be more correctly described as being diœcio-polygamous or a polygamo-diœcious plant. Last season the writer came across what had every appearance of being a male tree with a lot of pear-shaped fruit hanging upon its pendulous racemes. It was growing amongst a lot of other trees close to the cook-house. He mentally marked it down for observation, but ou going to examine it a few days later somebody (who, as usual, was nobody) had cut it down and taken away the fruit. This was in the Dibrugarh neighbourhood, but he could not find out whether there were any more in the district. In 1790 and 1791 Dr. Roxburgh reared a number of young trees in a garden situated a mile and a half from any other papaw tree. As soon as he could distinguish the male trees he had them all destroyed, The females, of which there were nine, grew luxuriantly, being in a good soil and well watered. They blossomed as usual and the fruit grew till it was about half the usual size; then as before they uniformly fell of without appearing to have more than the rudiment of seeds. If Dr. Roxburgh had made an experiment the reverse way, by destroying the female and preserving the male trees, he possibly might have had the male in the absence of the female tree fertilized by its own pollen and producing fruit. As often happens with other kinds of trees, the pollen of the male may be entirely impotent in regard to its own pistil only when the more vigorous pistil is present on a separate tree. The question is of more than botanical interest, as when the so-called male tree fruits, it is said that the juice is more copious and produces more of the digestive ferment papain, which the unripe fruit of this tree contains.

The hope which was once entertained that papain would prove a curative agent for cancer has not been realised. But, according to a paper read by Dr. Hirschfeld at a meeting of the Royal Society held at Brisbane, it has been found to be a most valuable palliative on account of certain qualities possessed by it that had been overlooked, namely, its analgetic and its antiseptic properties. It is somewhat strange that the natives of India do not seem to be aware of the properties of its juice. One variety of the plant at least is a native of this country—the common Carica papaya of the bustees, which was introduced into England in 1690. Besides this variety we have carica cauliflora, a native of Caraceers; C. citriformis, a native of Lima; C. microcarpa monica; C. pyriformis, Peru; C. Spinosa, Guiana.

As the name indicates Microcarpa monica would appear to answer the description of the male tree which is said to bear fruit. If this were the case it would not be the male tree bearing fruit, as this variety is a hermaphrodite tree.—*The Indian Agriculturist.*

A NEW BANANA IN THE CONGO FREE STATE.

In the February number of the above journal, Mr. E. De Wildemau, Curator of the Botanical Gardens at Brussels, gives the following description of a new series of banana which was discovered by Mr. J. Dybowski, Director of the Colonial Garden at Nogent-sur-Marne, during his travels in the Congo country, of which he had neither seen the flowers nor fruit. Subsequently to his last voyage some fruits were received, of which the seeds were sown, and produced young plants at Nogent, and it is from these that Mr. Dybowski has given a summarised description of the "fetish banana" (*Musa religiosa*).

Although we have not been able to study the description of flowers, we immediately recognised that the plant from the French Congo had a great resemblance to those we propose to describe here. Mr. Dybowski has been good enough to forward, at our request,

specimens of the seeds and a fragment of the fruit of his *Musa religiosa*, but these are not sufficient to enable us definitely to solve the question whether *M. religiosa* and *M. Gilletii* are two specific types.

We might give as a distinctive characteristic the colour of the seeds, which are grey and dull in the former, whilst in the latter species they are of a beautiful brilliant black; as regards the measurement they are about equal. In consideration of this difference, and in the complete absence of information as to the flower, we have preferred to describe our plant under a new name, and to dedicate it to our collaborator, J. Gillet, S.J., who devotes a large portion of his time to the collecting of the plants of the Lower Congo. Besides, this plant will shortly make its appearance commercially, for the seeds sent by J. Gillet to the Messrs. Damann, of San Giovanni, at Teduccio (Italy), have germinated and produced young plants.

MUSA GILLETI, *De Wild* a new species. Plant 1 metre 50 to 2 meitres high (4 feet 9 inches to 6 feet 4 inches), not stoloniferous, more or less swelled at the base, completing itscycle of evolution in three years; during the first year, the plant is low, and has few leaves; in the second year it makes height growth still, foliated from the base; in the third year there is formed at the extremity of the stem, which bends over, a floral panicle. The lower leaves are ellipticall-anceolate, with a very strong sheatbed petiole, and with a very large and pronounced midrib. They are 1 metre 50 (57 inches) long, and have a translucent border. The upper leaves are 40 to 50 centimetres long (16 to 20 inches) those nearest to the inflorescence only attain to about 8 inches, and pass insensibly to the bracts; these become gradually narrowed as they reach the inflorescence; the leaves and the bracts are terminated by a narrow twisted elongated apex. The floriferous spike, shortly pedunculated, recurved, measures about 40 centimetres (16 inches) in length, not including the peduncle, and is formed of numerous persistent bracts, of which the ten or twelve inferior ones alone enclose the fertile flowers. The flowers situated at the seat of the superior bracts are male. The bracts are oval-lanceolate, more or less elongatd, and are from 4 to 5 and 9 centimetres (1 3·5, 2, and 3 3·5 inches) broad; and 71 to 35 centimetres (6 4-5 to 10 inches) long, more or less cute at the top. The flowers are arranged in two rows, to the number of ten or twelve: five or six of the inside row, five on the outside. The perianth has two lips, the smaller enclosed at the base by the larger, the first tridentated at the top, and longitudinally mucronated, about ⅜ inches in length, not including the prolongation; the longer caniculated, trilobed at the top, from 2 to 3 centimetres (4 5 to 1·5 inches) long with lobes sometimes 4 millimetres (4·25 inch) long, sub-obtuse or sub-acute at the top. Stamens to the number of six as long as the exterior lobe of the perianth, one of them often more or less abortive with slender pedicel, with 2-celled anthers, about 12 millimetres (12-25 inch) long, obtuse at the top, fixed at the top of the pedicel, attached in their whole length to the connective; pollen grains globular or sub-globular with a thick external wall sbowing grains at intervals. Inferior ovary, triloculates, with numerous ovules, of 2-series with elongated style as long as the stamens, exceeding them slightly, terminated in a claviform stigma, irregularly lobed. Fruit oblong, angular, sub-pyriform, attenuated to a sort of pedicel at the base, shiny, greyish exteriorly, irregularly tuberculate in consequence of the protuberance of the seed crowned by the base of the lobes of the persisteal perianth, enclosing about twenty-three seeds, and measuring about 5½ centimetres (2½ inches) long by 2½ centimetres (1 inch) broad towards the end. Seed enclosed in a pulp which becomes pulverous and white in a dry state, ovoid-angular through mutual pressure 8 millimetres (about 4 lines) high by 9-10 millimetres (about ⅜ line) broad, the attaching cicatrice 3 millimetres (3·25 inch) in diameter of a beautiful shiny, black colour, limp, furnished at the top with a little punctiform depression surrounded with a slightly obtruding border. Habitat: Borders of the ravines in the region from Kisautu to Luvituku, the two extreme points of the Lower Congo, where up to the present it has been observed. (J. Gillet, 1900).

From what we have said above, it would appear clear that Gillet's plant belongs to the group of *Musa Ensete* Gmel., and that, therefore it belongs to the sub-genus *Physocaulis*, Baker (1), which includes only six species in tropical Africa and eleven in the whole world. From the size of the seed it approaches *Musa Livingstonia* and *proboscidea*, but in the first of these, instead of being smooth, they are tuberculous, and as regards *M. proboscidea*, the height of the plant (four or five times as tall as a man) and the length of the inflorescence are sufficient to show that it is widely distinct from the former.—*Review Des Cultures Coloniales*

CLOVE PLANTING.

Sir Lloyd Mathews writes to us as follows:—I send you a memorandum which was written for me by Mr. Lyne, and which please publish in the *Gazette*. It gives an idea of what the outlay would mean for anyone who desired to plant cloves in Zanzibar. Probably 20 per cent should be added to Mr. Lyne's figures to meet the case of a private individual who might not have such facilities as he had, as for example, in the employment of prison labour. Otherwise the figures represent what the actual expenditure would amount to in laying out and planting such a plantation as he describes.

As regards coconuts the cost per tree would probably amount to about 50% more, or roughly, 1½ annas per tree to plant. In the interval between planting and bearing the ground can be occupied by bananas, muhogo, sweet potatoes, and other annuals which might be expected to pay for the cleaning and cultivation of the plantation during that interval. Planting cloves and coconuts in Zanzibar is not, it will be observed, a very serious undertaking here, and is well within the reach of small capitalists.

THE LAYING OUT AND PLANTING OF A CLOVE PLANTATION OF 6550 TREES.

This work was begun at Dunga on March 5th and completed on April 22nd. Omitting Sundays and holidays—the Sikukuu of El Hadj fell within that period—the total number of working days was 39. As previous to March 5th no preparation had been made for the laying out of this clearing, and as from that time the work was carried on without interruption to its completion, it constitutes a useful experience as to the time and men required for, and the cost of, planting Cloves in Zanzibar. On an average there were 42½ native people occupied daily, beside overseers; of these 16½ were prisoners, 6 boys and 20 ordinary paid labourers.

The prisoners were employed chiefly in collecting the seedlings into the nursery, and afterwards, when the time came, in carrying them out to be planted. Some who were in leg irons were set on to dig holes, at which work they proved almost as good as the paid labourers. The boys were employed in helping the liners, in filling in the holes, in helping the planters and a few at times in digging holes. The employment of prisoners and boys has reduced the cost of the plantation considerably. Clove-planting consists of five main operations, namely: lining, holing, filling in the holes, collection of, and planting

the seedlings, shading and mulching. *Lining.* The trees were placed 21 feet apart, which gives 98 trees to the acre.

Two men and a boy are required for each gang of liners. Each gang has a rope—or better still a surveyor's chain, which will not stretch nor shrink with the weather—with a piece of turkey red tied on at the required distances. The gang is also provided with three or four bamboo flags or ranging rods; attached to each gang are two extra men with grass-knives, who go ahead and clear a line through the long grass. These men work singly, not two together in one line, and have flags to keep them straight.

No large clearing operations were undertaken before laying out. There was no time for this in the first place; secondly the ground in every direction was occupied with native patches of muhogo etc; thirdly, in the case of trees placed so widely apart, it is not necessary to clear all the ground at first. Lines were set out parallel and at right angles at convenient places and marked off into 21 feet spaces for keeping the liners straight. When they came to know their work, a gang and two leaders could do 300 pegs a day, though at first they could not do half that number.

The lining cost R38, which is at the rate of nearly R6 per 1000.

Holing was performed with English spades and small crowbars. The spades proved by far the better implements of the two. The men averaged 19·2 holes per day per man; a full day's task for an ordinary man was 20 to 30 holes according to the nature of the soil; boys less. The holes were 1½ ft. broad at the top, 1 ft. at the bottom, and 1½ ft. deep. The last three days of planting we reduced the dimensions of the holes to 9 inches wide and increased the task to 60 per man per day, as we were pressed for time and wanted to make the most of the rain. Holing cost R72-10, a little over R11 per 1000.

Filling-in. This should be done at least a fortnight before planting is begun, but owing to lack of time we had for the most part to plant immediately. The soil had therefore not sufficient time to settle in the holes and form firm compact beds for the reception of the young plants. The soil will now settle *after* the trees have been planted, instead of before, and thus disturb the roots. Filling-in cost R34-7-9 or R5¼ per 1000 and the fillers-in averaged 45 holes per diem.

Collecting the Plants. We had at the time very few plants in the nursery, so we sent into the plantations for self-sown trees and in this way collected 10,513 seedlings; 7,072 came from Machui and 3,441 from Mbweni. The latter we purchased at the rate of R1 per 100. Most of the young trees we gathered into the nursery, watered and hardened them to the sun. A fortnight of this treatment enabled the young trees to develop new root growth before being left to themselves. It also weeded out those that drooped and died. We found the advantage of this after the clearing was finished, as the percentage of deaths among those trees so treated is at present very small. 1,500 trees were however put straight into their holes without being nursed. The weather was at the time very wet and excellent for planting. The contrast between the trees nursed and those planted straight-away is very marked. The former for the most part look extremely healthy and resumed their growth almost immediately they were put out, while the latter drooped at once and I believe that a considerable proportion of them will die. It is too early yet to count the number of deaths altogether, as many of those whose leaves have drooped will doubtless recover.

The fact of our having collected 10,500 young trees in so short a time speaks well of the resources of the plantations if they were put to account. Most of the trees we planted had two years' growth, some three. Arabs, I believe, prefer to plant trees 3 to 4 ft. high. The method of lifting the trees in the plantation explains how it comes to pass that in Arab plantations several trees, sometimes as many as 7, are planted together. Self-sown clove trees often grow very thickly together. In lifting the trees the men carve out a cylinder of soil about 5 inches in diameter to preserve the soil intact about the roots, and as many trees as happen to be within that area are lifted and planted together.

The actual *planting* of the trees extended over 10 days and occupied on an average 4½ men a day. Thus each man planted on an average 145 trees per day. On April 10th 1225 trees were planted by 5 men, and on April 12th 1100 by 7 men.

The total number of trees collected into the nursery was 9013; of these 5050 were planted out and 2812 are still living in the nursery. Thus 1151 have died, a proportion of 12.7 per cent.

The plants cost R1.9 per 100 to collect.

Shading and Mulching.—This work is still continuing. After the first two days we ceased shading the trees that had come from the nursery, as it was found the exposure did not hurt them, that, in fact, they seemed to be better without the ferns. But the trees that were lifted and planted at once soon began to droop under the sun, and these were immediately mulched and afterwards shaded. We shall mulch all the trees, clear a large ring around them to let the air in, keep the soil round the roots well cultivated, and this will be all that they will require till they begin to bear, when the whole ground will have to be cleared.

TOTAL COST OF THE PLANTATION.

Nursery	50	—	9
Lining	38	—	—
Holing	75	10	—
Filling in	27	13	3
Collecting	102	5	0
Planting	19	4	9
Shading and mulching	23	3	6
General transport ...	7	1	9
Boys extra	13	2	—
Outside labour extra	11	11	0
Purchase of plants ..	44	7	—
Total...	R412	11	6

The average cost per tree is therefore 4.03 pice.

The plantation is 66.8 acres in extent and contains 6550 trees, planted 21 feet apart.

We are still lining and holing in preparation for filling up the gaps among the big trees and the space that intervenes between them and the new clearing in order to bring the cloves together into one block. There are probably 1500 to 2000 more trees to plant, but it will depend upon the weather whether we do it now on later.

R. N. LYNE.

Dunga, April 25th, 1901.

Correspondence.

To the Editor.

CEYLON AND INDIAN TEA IN LONDON

London, 10th May.

SIR,—I send you an analysis of the proportions of the three lowest grades of Indian and Ceylon Tea, taken from Gow, Wilson & Stanton's Circular:—

INDIAN TEA, APRIL 4TH, 1901.

36,790 packages ;— of this

7,559 were Pekoe Souchong or	20	cent
2,371 were Broken and Souchong or	6½	do
3,445 were Dust, Fannings &c., or	9¼	do
Total lowest grades	35¾	per cent

CEYLON TEA, APRIL 4TH, 1901.

25,479 packages ;—of this

2,991 were Pekoe Souchong or	12	per cent
107 were Broken and Souchong or	½	do
1,167 were Dust, Fannings &c., or	4½	do
Total lowest grades	17	per cent

INDIAN TEA, APRIL 19TH, 1901.

32,594 packages;— of this

7,270 were Pekoe Souchong or	22	per cent
2,447 were Broken and Souchong or	7½	do
2,053 were Dust, Fannings &c., or	6¼	do
Total lowest grades	35¾	per cent

CEYLON TEA, APRIL 19TH, 1901.

31,594 packages—of this

3,487 were Pekoe Souchong or	11	per cent
289 were Broken and Souchong or	⅞	do
1,362 were Dust, Fannings, &c., or	4¼	do
Total lowest grades	16⅛	per cent

INDIAN TEA, APRIL 26TH, 1901.

25,286 packages—of this

5,088 were Pekoe Souchong or	18	per cent
1,742 were Broken and Souchong or	7	do
2,581 were Dust, Fannings, &c., or	10	do
Total lowest grades	37	per cent

CEYLON TEA; APRIL 26TH, 1901.

33,329 packages—of this

4,144 were Pekoe Souchong or	12¼	per cent
372 were Broken and Souchong or	1¼	do
1,778 were Dust and Fannings or	5¼	do
Total lowest grades	18¾	per cent

CEYLON TEA, MAY 3RD, 1901.

25,641 packages—of this

2,808 were Pekoe Souchong or	11	per cent
127 were Broken and Souchong or	½	do
1,173 were Dust, Fannings &c., or	5	do
Total lowest grades	16½	per cent

I have not checked the figures. Anyone can do so, who may think they are wrong. They are worth consideration. As you know whence the figures are derived, you will be able to take them out for yourself; it will I think be worth your while to do so.

Those who ever thought that High Country planters would put out of plucking any of the Tea yielding profitable results, for the benefit of their Low Country neighbours, must have an imperfect knowledge of human nature.

It is the impracticable part of the scheme of the Joint Committee that has failed. Ceylon planters were blamed for making too much inferior tea ; they are now blamed for going to make too much good tea!! See Messrs. Gow, Wilson & Stanton's circular of 3rd May, 1901.

C. S.

P.S.—Does not making better tea mean restricted production from finer plucking ?—C. S.

GROWING PEPPER AT A HIGH ELEVATION.

North Cove, Bogawantalawa, May 14.

DEAR SIR,—I have been looking through some of your back numbers for information about "Pepper" but can find nothing to help me. Would you or any of your correspondents tell me whether pepper may be grown to pay at 5,000 feet elevation, and if so what is the best variety to cultivate.

I know where to find any quantity of wild pepper and it seems to bear well. If you can afford me any information on this subject, I shall be extremely obliged, as I am thinking of applying to Government for a grant of land on lease for the purpose of experimenting at a high elevation.—I am, yours, &c., T. FARR.

[To save a delay of three weeks in answering, we venture to give Mr. Farr's letter insertion in our daily, in order to say that we have never heard of pepper being grown in Ceylon successfully above 2,000 to 2,500 feet. If therefore Mr. Farr is prepared to spend money in pioneering experiments at 4,000 to 5,000 feet elevation, he certainly will deserve encouragement by a grant of land. But first let him have the wild pepper tested by sending a sample to his Colombo and London Agents. Our manual "All about Spices" is unfortunately out of print; but we can send Mr. Farr two back numbers of the *T.A.* of which the late Dr. Trimen wrote in his Annual Report (in 1889) as follows :—

"As regards *Pepper*, I am glad to see signs of its being taken up on a larger scale. We have disposed of considerable quantities of both cuttings and seeds of the good native variety grown at Henaratgoda, and it is satisfactory to learn that a consignment of this sort grown on an estate near Kandy, so high as 2,000 feet, has sold in London at an excellent price. This cultivation is also of course eminently suited to the native villager, by whom indeed it has long been practised on a small scale. Good accounts of the modes of cultivation followed in Johore and in Malabar, respectively, will be found in the 'Tropical Agriculturist' for September and November, 1888, (pp. 154 and 354) ; the latter being probably the most suited to the conditions prevailing here."

—ED. *T.A.*]

RUBBER PLANTING IN CEYLON.

Upcountry, May 23.

SIR,—Would you advise anyone going in for rubber cultivation in Ceylon ? What is the best kind to plant, and how long would one have to wait for returns ? Any information on the above will much oblige, yours, AN INQUIRER.

[Certainly, we advise rubber planting in suitable soil and damp climate up to 1,500 feet. Study "All About Rubber," and the *Tropical Agriculturist*, with the Royal Botanic Gardens circulars of Mr. Willis and his coadjutors—and see our summary of all available information in the "Directory and Handbook" early next month.

Enquire of Major Gordon Reeves if seed off his Castilloa trees is available: we should be inclined to try this kind in Matale.—ED. *T.A.*]

CULTIVATION OF CHILLIES IN CEYLON.

Colombo, May 28.

SIR,—Could you put me in the way of obtaining reliable information about the planting of chillies on a large scale. Has this ever been tried in this country by a European? I understand that most of the chillies consumed here are imported from India, so that there should be a good profit if planted on suitable soil where they will crop well.

The estate where I would propose to plant them has very good soil and is situated at an elevation of about 1800-2000 feet. The climate is a dry one, excepting for the months of the N.-E. monsoon. Any information will be thankfully received.—Yours faithfully, W. E. G.

[We refer our correspondent to the *Tropical Agriculturist* for August, 1900, page 75, and still better to November, 1900, page 369, where —after instructions as to planting—it is stated that very little labour or trouble is required to cultivate chillies in almost any kind of soil on the N.-E. coast of Queensland. Whether that is a guarantee for success at 2,000 feet in Ceylon can only be proved by trial. We think the experiment well worth a trial. (Has our correspondent ever heard of the hard-up planter, whose coffee had gone to the bad, making an honest penny out of a patent medicine for rheumatism and other ills of the flesh in the mother-country—a medicine which took the breath away of old people, but certainly warmed them up in an innocent way: on being pressed by an old friend, the patentee confessed he had nothing but a decoction of Ceylon chillies!)—However, as our correspondent says, there is a real need for the local cultivation of chillies and other vegetables: it is a disgrace that we should be so dependent on India for so many products. Look for instance at our imports of arrowroot, tapioca and sago, all of which should be produced not only for local consumption but export; and yet Ceylon pays nearly R100,000 a year for its supply!—ED. *T.A.*]

CACAO PODS.

Wattegama, May 30.

DEAR SIR,—Since writing my first report on Cacao Pods and Seeds, I have received a pod said to be a new variety called *Puerto Cabella* and sold by one planter at 30 cents per pod. I have been asked to say whether that pod was anything like the pods I gave an account of. This pod was 7½ inches long, 10½ inches circumference, weighed 1 lb in all; Seed 12 roundish and 28 flattish; weight of wet seed 4¼ oz. and colour of pod, shape and seed, when cut open, as near as possible to what I described as No. 2 Cundeamor. This latter was the name attached to the original plant received by me from Trinidad in 1878 and there is now many trees of that variety in Ceylon, planted from seed of that original plant. The pod I described was larger, more in weight, number of seed, &c. Another pod has been sent to me; this is from a Ceylon cacao estate and is also a *Cundeamor*, but grown on poor soil, weight of pod ¾ lb, 41 seed 2⅝ oz. only (wet). C. P.

CEYLON (AND OTHER) TEA IN GERMANY.

Kandy, May 31.

SIR,—I herein enclose interesting statistics, received from Mr. J H Renton, regarding Ceylon tea in Germany.—I am, Sir, Yours faithfully,

A. PHILIP.

TEA ENTERED FOR HOME CONSUMPTION IN GERMANY.

		1899. Kilos.	1900. Kilos.
From Great Britain	...	302,300	322,500
British East India }	..	370,500	235,100
Ceylon }		included in India	116,700
Holland	..	193,100	104,000
Dutch East Indies	..	300,200	380,800
China ..	...	1,828,700	1,831,200
Elsewhere ..	..	34,100	63,200
		2,958,900	3,053,500
		lb.	lb.
	Say	6,509,580	Say 6,717,700

Ceylon has only been kept separate from India since September, 1900:—

EXPORTS.

		lb.	lb.
From Colombo	..	346,959	402,717
From Calcutta	..	704,877	861,780
		1,051,836	1,264,497
Against Imports for Home Consumption	...	704,000	773,960
What has become of the balance of	..	347,836	490,537

NATIVES AND TEA DRINKING.

Ambegamuwa, June 10th.

SIR,—I think it would be a capital idea if you would invite suggestions in your columns for educating the natives of Ceylon to drink tea; you will remember what Lord Curzon said about the 300,000,000 natives of India that were only waiting to learn to like tea before taking many million pounds of our output off the present markets, or words to that effect. At present my idea is that, though tea is dirt cheap, it is not so very easy for natives to buy it at anything like the price we sell it for in Colombo, even supposing they wish to buy it; and a great proportion do not wish to buy it at all because they have never learnt to like it.

I consider it is our duty to teach them to like it and to enable them to buy it from us at the price we are getting for it in Colombo, minus brokers' charges, rail freight, &c.,—and packing in certain cases. Now for *my* suggestions. They are put forward for what they are worth; better ideas should follow, but someone must make a start.

(1). Let every Superintendent have a notice up in Tamil and Sinhalese at some place where it will catch the eye of the passer-by, to this effect:—

"Good tea for sale for cash (say) 1st grade 20 cents per lb., 2nd grade 10 cents per lb.

BRING YOUR OWN SACKS."

The above would be for red leaf and souchong This would be a nuisance for the Superintendent, of course; it would be difficult, but not impossible, to check, and it might lead to thieving, which by the way would not be an unmixed evil, if they consumed what they stole. So much off the present market.

(2) Get natives under some sort of contract to hawk tea round the towns for sale cheap.

Here the Cess would have to come in. A certain amount of tea of low grades could be purchased from estates at ordinary Colombo rates, and sent round in carts and ladled out for cash at the doors of the inhabitants. It would not be advisable to sell at a profit at the start, I should say.

(3) "Given away with a pound of tea" is a saying that does not convey as much now perhaps as it used to, but, when I was a podian, the village grocer used to tempt the rustics to buy tea by giving as presents cheap crockery and ornaments of sorts to those that bought. What succeeded in the old country, and it did succeed, might succeed here.

If I were an enterprising Burgher lad, keen on making money and with a soul above commercial honesty, I would beg, borrow, or steal a waggon, bull, and stock; I would traverse the outlying districts from end to end, and I would flood the villages on my way with the cheapest of teas and the grandest of Birmingham tea-pots and German neckties.

There would be money in it. In towns Caddy-keepers might try the same thing. If too that enterprising Burgher youth could only learn the "Cheap Jack" business, what a time he would have of it. He might end up in the Legislative Council; think how his training would help him there, and, mind you, every pound of tea he sold, so much the better for us. You ought to get plenty of other suggestions; the difficulty is, who is to take it up? It is everyone's business and no one's business. Why cannot the "Thirty Committee" appoint a man (there are plenty out of billets) to boss the show, approach the principal natives, get their ideas, and try and work with them to open up a trade between the tea planters and the thirsty millions?

Who can deny that the object to be obtained is worth a little trouble and thought?—Yours, etc.,

"CHEAP JACK."

NUTS FROM THE COCONUT PALM.

ANOTHER "RECORD" NUMBER.

Hanwella, June 15.

DEAR SIR,—*Re* the question about the largest number of nuts of all sizes on a coconut palm at one time, in your paper of the 10th inst., I have much pleasure to inform you that, on a visit to Madampe, the large coconut planting district, about three years ago, I came accross a few heavily laden palms, and out of curiosity I counted up the bunches and endeavoured to find out the number of nuts on one of the trees.

There were 27 or 37 bunches in all, and counted over 400 nuts of all grades, but I failed to count up all. I think there were about 500 to 600 nuts in all on that tree. As regards the largest number of nuts at a picking I know of some trees in the same district which gave 300 nuts at a quarterly picking. Of course, I admit that this is not the common yield of the district. I have a few well bearing palms here, some of which have about 20 bunches, having about 400 nuts of all grades.

A NATIVE PLANTER.

[Can any one beat this record? Signed letters preferred. ED. *T.A.*]

RUBBER CULTIVATION IN CEYLON:

THE PRESENT STATE OF THE INDUSTRY; BACKWARDNESS OF TEA PLANTERS IN THE LOWCOUNTRY IN DOING THEIR DUTY BY RUBBER; GREAT ENCOURAGEMENT TO INTERSPERSE TEA WITH PARA RUBBER TREES IN MOIST LOW DISTRICTS.

We have just had the estate returns analysed and summed up, and we are distinctly disappointed with the result as regards the extent to which rubber plants —especially of the Para (Hevea) variety— have been put out among the tea, or along boundaries, or in separate clearings, in the lowcountry districts which are most suitable for their successful growth. These specially include the districts of Kalutara and Udagama, Ratnapura, Kuruwita, Lower Balangoda and Rakwana, Lower Morawak Korale, and in fact all the South-west division of Ceylon with a large slice of the Kelani Valley, Kegalla and the host of minor districts included between the Kelani and Nil gangas. This is apart from the opportunities for successful planting in some of the Kandy and Matale districts up to 1,500 feet altitude. But in saying we are disappointed at the result of our investigation, we have the satisfaction of finding that the total extent is much in advance of the estimate with which the Director of the Royal Botanic Gardens has favoured us. In March 1878, Mr. Willis estimated that the equivalent of 750 acres were covered with rubber. On the 13th instant he writes:—"I should double that now; but, of course, this is only a rough guess: we have sold locally enough seed for 1,200 acres; but there is more private, than Government, seed now available." This is true, and considering that a census on only two estates—Culloden and Heatherley, certainly the leading rubber growers— in the Kalutara district, shows a total of all ages of 40,000 growing rubber trees and that another estate in Matale West reports 22,000 Paras (some up to 6 and 9 years old) and that patches and interspersings of rubber are found on so many other places, the grand total must, in area, be a good deal in excess of the Director's estimate of 1,500 acres. Of course, a great deal depends on how many trees should be counted to an acre. One counsellor or specialist has actually gone so low as 50 trees. This, we think, many too few. Counting 15 by 15 feet as a fair allowance between Para trees, to do them full justice, we take 200 trees in round numbers as the equivalent of an acre and we find that, in May, 1891, we can count on 2,597 acres as the extent represented by rubber plantings against 1,071 acres in July, 1898. Of course, if 100 trees be taken as the equivalent of an acre, we should have 5,000 acres to deal with; but in any case we do not get beyond the half-million of growing trees of all ages and kinds—chiefly Para, but including a certain number of Ceara—many of them old trees put out in the "boom" of 15 to 20 years ago—with a few *Castilloas* and some of the *Landolphia* vine. Now with trees up to 9, 10, and 12 years, it is time we were hearing of

appreciable harvestings and expors of rubber. But it is a fact, as Mr. Willis hints, that the fortunate owners of old trees have gone in for crops of seed rather than of rubber, and our export returns for the past three years will show how freely Para seed has been purchased from Ceylon for the Straits and other Far East regions, as well as Burma. Here are the figures for two years: 1898—exported Rubber seed to the (Customs) value of R10,363 and in 1899 to the value of R40,714; while, we feel sure, there has been no falling-off in 1900. As regards the export of crude rubber, the returns are very poor so far; but there is no question that the time is rapidly approaching when there should begin to be an appreciable export of rubber from Ceylon, and we would urge all low-country proprietors, who have not done so, to begin to add rubber as a minor, but valuable, product to their tea. Cannot something be also done with the old Ceara trees and their crops of seed, in districts not suitable for Para? Even this kind is not to be despised as has been shown by experience gained in Dumbara; while we append a recent report from an Uva district which shows that it should not be difficult to establish a nursery and to form clearings of Ceara, and, in spite of the drawbacks pointed out, a gathering of ⅜lb. of rubber per cooly per day should surely leave a profit:—

"There are a few large trees here now. When taking the bark off for tapping about six feet up the trunk white ants are attracted by the juice. They attack the trees most vigorously and kill them very quickly.* The trees seed very freely and a lot of young plants come up, which grow rapidly; in fact they are rather a nuisance where they get amongst the cultivated tea. A cooly will collect about ⅜ lb. wet rubber per diem."

But it is in respect of Para in our moist low districts that most planting has to be done and here is what one planter, of experience in rubber, writes:—

"A vast number of young plants die off before they have time to develope, but once established they are very hardy. (I am speaking of the Para variety). There are besides a number of old Ceara trees scattered about the country representing a very uncertain area, and lately some *Castilloa Elastica* have been planted, but not many.

"It has always been a surprise to me that more Para Rubber has not been planted *through* the tea on low-country estates. The shade they throw does the tea good rather than harm, and when they have reached a certain age (depending on soil and other conditions) they become a most valuable source of revenue.

"I have heard that the old trees on Culloden which, I understand, have been crudely tapped at intervals for some time past, must have averaged from 15 to 20 lb. of rubber apiece; and they are still in excellent heart, though the bark has been dreadfully lacerated by imperfect tapping. A cooly, after a little practice, can collect from 1 lb. to 1¼ lb. per diem and at present prices (3s 6d per lb.) this leaves a very fine margin of profit. Planters, however, are always impatient for returns and it is difficult to get them to see the advantage of introducing a cultivation unless there is a prospect of a speedy turn-over; hence the few rubbers that have been introduced amongst the tea, a source of regret now and it may become still more so before long!"

We think the above ought to stir up low-country tea planters to lose no time in adding this rubber string to their bow. We should fain see not half-a-million but many millions of rubber trees growing in the island to add to its agricultural wealth and increase the value of tea plantations.

* This is something entirely new—we never heard of it in Dumbara—and it is surely due to very rough handling of the tree in tapping?—ED. *T.A.*

PLANTING NOTES.

FUMIGATING CITRUS TREES FOR SCALE.—An orchardist, writing to the Fruit Expert as to results achieved by fumigating citrus trees for scale insects, says:—"I have fumigated about 900 trees with the most happy results. Trees badly infested with scale lost a large portion of foliage, but the after-growth was very luxuriant indeed; and from unhealthy, forlorn-looking things, they were transferred into bright, glossy, healthy trees."—*Agricultural Gazette of New South Wales.*

A PRODUCT FOR OUR PATANAS.—Australian wattles (the *acacia dealbata* or *decurrens*) should grow readily on our patanas and the bark is valuable for tanning. We read that "the Wairangi wattle plantation in the South Island of New Zealand contains 1,900 acres. The output of bark annually reaches 150 tons, and this will shortly be increased to 200 tons. The variety grown is the *Acacia decurrens*." Why not Uva patana plantations covering thousands of acres?"

A GERMAN BOTANIST is said to have discovered that, out of 4,300 species of flowers cultivated in Europe, only 420 possess an agreeable perfume. Flowers with white or cream-coloured petals are more frequently odoriferous than others. Next in order come the yellow flowers, then the red, after them the blue, and finally the violet, of which only thirteen varieties out of 308 give off a pleasing perfume. In the whole list 3,880 varieties are offensive in odour, and 2,300 have no perceptible smell, either good or bad.—*Indian Agriculturist,* June 1.

FISHING WITH A STEAM PUMP.—A pond on the farm of La Marlequette, bordered by rocky shores, had never been drained, owing to the expense. Last year the proprietor conceived the idea of making use of a powerful steam pump. Each stroke of the piston drew up a heetrolitre (25 gallons) of water, and the pond was therefore emptied in a few hours, and not only was the water drawn off, but also all the fish that it contained. This was a revelation. All the owners of the ponds in the neighbourhood have followed suit, and the owner of the pump is making a speciality of this kind of work. He lets out one of his pumps, modified for this purpose. Each stroke of the piston brings up a torrent, with which are mingled fish and crawfish, together with dirt and débris such as are contained in every pond—old sardine boxes and the like. A sort of metal basket receives the whole. The water and slime escape, while a boy collects the fish and sorts them according to species and weight.—*Home paper,* May 25.

THE TEA PLANTING INDUSTRY OF CEYLON, MAY 1901:

387,000 ACRES OF TEA ON PLANTATIONS AND 5,000 CULTIVATED IN NATIVE GARDENS.

A good deal of curiosity has been manifested by Visiting Agents and others as to how the figures for tea area would work out on the present occasion, in view of the check to planting and the possible abandonment of unprofitable fields. In July 1898, the total extent on plantations was 364,000 acres; but we showed that, reckoning a certain acreage of coffee planted up with tea and about 7,000 acres in native gardens, we might take the Tea Industry of Ceylon as being well on to 375,000 acres by the end of 1898. Now the extent covered with tea on the regular plantations is 387,000 acres, in consequence of additional clearings in 1899 and last year, besides 5,000 acres, which we make out the *cultivated* native gardens to represent at the present time, and a certain extent still, we fear, to come over from coffee fields; but, perhaps, against this may go the gradual exclusion of poor corners of tea in different districts, so that the safest reckoning will be to put 392,000 acres as representing the Tea Industry of Ceylon in May 1901—an increase of 17,000 acres on the full reckoning for 2¾ years ago. Out of this total of 392,000 acres, we put the extent of tea which is five years old and upwards at 360,000 acres (and this must have given an average of 411 lb. per acre in last year's crop)—so that there are fully 30,000 acres of young tea yet to come into full bearing in Ceylon. This should be a further warning to our Indian neighbours against further planting at this time.

The greatest addition of tea to any district in the past two years is in Haputale, where the increase equals 4,000 acres; Badulla district shews an addition of 1,500; Kalutara 2,000; Kelani Valley 1,400; while Dimbula has more tea by 1,800 acres and Kuruwitta district an increase of 1,200 acres. On the other hand Dikoya has altered very little and the return for Pussellawa and a few other districts positively aggregates a less total than in 1898.

Dimbula of course heads the list with the largest acreage of tea—over 46,000; while the Kelani Valley comes next with well-nigh 35,000 acres, and Dikoya only a little under 30,000. In all Uva there are now 60,000 acres of the staple; while between Great Western and Adam's Peak the three districts comprise 95,000 acres—surely one of the finest expanses of tea in the world.

MR. KELWAY BAMBER AND OUR TEA INDUSTRY IN UVA AND DIKOYA.

Mr. Kelway Bamber has been away on a visit to an estate in the Lunugala district and also (yesterday afternoon) to another estate in Dikoya, and returns to Colombo early next week. His investigations are widening and, after the preliminary canter hitherto, the results should increase in interest to the planting community. One of the most curious things that has struck Mr. Bamber is that young tea on new clearings nowadays, he is constantly being told, does not give anything like the same result in growth in the same time as when tea was first planted. The cause of this, Mr. Bamber thinks, must lie in the smaller quantity of carbonic acid, which goes to form organic matter, that is drawn from the air nowadays by the average tea-bush in any one district; and new clearings near old tea-fields are thus bound to show smaller results than the former young clearings in new country. As little as 3 to 5 per cent of inorganic matter in the tea bush is drawn from the soil, the material for organic matter mainly from the air. It is to return some of this organic material to the soil that should be object of the cultivator. In addition to the burying of prunings, Mr. Bamber advises cutting down and burying the jungle *illu*,—after leaving it awhile to rot, preferably, so as to give off carbonic acid gas.

Other aids to tea-planters would be forthcoming if a Geological Museum, with specimens of rock from every district, were attainable in Ceylon. Rocks, it must be remembered, are almost invariably indicators of the soil to which they belong; and if such a geological branch could be added to the Colombo Museum, Mr. Bamber would be able to extend his scientific work to the analysis of the constituents of the rock-formations of the various districts and the determination of the suitability or otherwise of the soil for tea, or indeed for other products. We trust that, as soon as the time comes for Mr. Bamber to take his share in such a work—which, we think, will be intimately connected with the Geological Survey when *that* comes, but can scarcely wait for it entirely,—Government will do their part with a ready hand. The planters, in providing typical rock specimens from their several districts, we may be quite sure, will readily do their part.

SAMBUR-HUNTING IN CEYLON.

BY THOMAS FARR.

(From the *Wide World Magazine*, May.)

[A detailed description of a very exciting sport practised in the Horton Plains district. The photographs will be found interesting; but we desire to draw special attention to the spirited frontispiece and other special drawings which have been prepared for this narrative by Mr John G Millais, F Z S., etc. For twenty years Mr Farr has been the leading elk-hunter in Ceylon, and has been master of three different packs. In his article he describes "the run of his life."—ED.]

Sambur, or elk as they have been called in Ceylon from time immemorial, vary in courage to a most striking degree. There is the stag that will bellow and squeal almost as soon as he catches your eye—even before a hound has touched him; and then there is the gallant, fearless brute that will fight to the last and die game without so much as a groan.

But I must describe elk-hunting as it is carried on in Ceylon before I give you an account of the grand "day" we had on the 11th of June. Sir

Samuel Baker has described the sport in two most readable books; but beyond this I have seldom come across an accurate account of it as it ought to be and generally is, I have once or twice read descriptions which were ludicrous from their inaccuracy, and the sport seemed to have degenerated into a scurry with a nondescript pack of tykes, attended by a crowd of people armed with guns and spears.

Then comes a very good portrait of

THE AUTHOR, MR. THOMAS FARR, FOR TWENTY-YEARS THE LEADING ELK-HUNTER OF CEYLON.

(From a photo by F and R Speight, 178, Regent Street, W.)

"Elk" hunting, as it has always been carried on by some two or three recognised packs in Ceylon, is almost entirely on foot, and the only weapon used is the hunting-knife with a ten-inch blade. A horse is occasionally useful to take one from point to point in a hard run, where some game track, native path, or road lends its assistance; but in nine cases out of ten you would find your horse up to his girths in a swamp before you had followed a pack of "elk" hounds across country for a quarter of a mile.

The country is a very stiff one, lying at the summit, more or less, of the mountain zone of the island, and falling down from this undulating plateau of some 8,000 ft. to elevations of 4,000 ft. and 5,000 ft. Vast tracts of forest are here interspersed with open downs of short, coarse grass called patanas, and at the bottoms of the valleys are streams of some volume and size. These will be found widening out into grand pools, narrowing to shallow rapids over rocky beds and impassable in floods, or plunging down deep gorges and chasms and falling over bare precipices and crags. Waterfalls of 50 ft. and 100 ft. are necessarily common in such a country, and one I know of is some 2,000 ft. At the very lip of this "Banjy" I once killed a magnificent stag. It is a big country, too, where I have chiefly hunted during the past twenty odd years, and where the hunt I shall endeavour to describe took place. It is known as the Horton Plains Country, and may be described as the "Roof of the Island." Through its open grassy downs meanders the most perfect trout stream it is possible to imagine. For some ten years ova have been imported from England, and the stream has been well stocked, affording splendid sport to the members of our fishing club.

As for climate it would be hard to beat anywhere, and at this high elevation, over 7,000 ft., it is easy to imagine that hard exercise, even in the tropics though it be, is not only possible but enjoyable. Often during December, January, and February the patanas are white with hoar-frost up to 6-30 a.m., whilst the shade temperature during the day varies from 55 deg. to 65 deg. Fahr.

"HOUNDS ARE UNKENNELLED BY 5 A.M. ON A HUNTING MORNING."

[Picture From a Photo.]

Hounds are unkennelled by 5 a.m. on a hunting morning, and with luck are back on their benches by twelve noon. The pack consists of foxhounds, deerhounds, and kangaroo hounds. The following would be a very "killing" lot: eight to nine couple of 23 in. English foxhounds, three to four couple of deer and kangaroo hounds, and three or four good, hardy Norfolk lurchers to run with the finders. Foxhounds are too apt to confine themselves to baying the hunted stag, which will often stand and defy them in the jungle, while he gets his wind, whereas a lurcher will give him a nip somewhere as a hint to move on.

As a rule the quarry carries a fine scent, and you may often see your lurchers ahead of the foxhounds, driving him for all he is worth. At this pace, especially if it is a matter of a mile up-hill or a quarter of a mile up a steep patana bluff, the stag gets blown, and comes down to the pool below to make his stand. There the deer and kangaroo hounds play their part. These are known as "long dogs" or "seizers," and they are distributed by one knowing the country and the run of the deer. Dog-boys are told off for this work, generally assisted by one or two of the field.

On more than one occasion I have seen the hunted stag or hind lie down in a pool close in front of hounds, all but the nostrils hidden beneath the surface of the water, and I have actually seen half a pack pass within a few feet of a stag's head just above the water without winding or seeing it. When, sooner or leter, he stands to fight it is generally in shallow water to begin with. On some narrow ridge of rock in mid-stream, with deeper water around him, he awaits the leading hounds—one or two couple probably, which have to approach him swimming. He shows no sign of fear, but an impatient stamping of the water with his fore-feet betrays his rage. As more and more come on, and the more formidable-looking "seizers" arrive on the scene, the situation changes.

Instead of attacking his pursuers in fierce rushes, he breaks his "bay" and seeks deeper water where even the big kangaroo hounds must swim to reach him. Here he will stand up to his chest in water, rearing up occasionally to pound huntsmen and hounds as they approach him. The knife being the only weapon used, a near approach is necessary to give the fatal thrust behind the shoulder.

The stag, too, takes good care to keep his head towards you, so that the vulnerable point in his side seems unattainable. Then, when still harder pressed, he takes to deeper water, and swims at such a pace that, unless hampered with hounds at his ears, no human being in his clothes can hope to keep near him. As he crosses the shallows at the head of the pool or passes some convenient rock the sportsman takes his opportunity and a skilful thrust is often as effectual as a well-directed bullet would be.

If the stag takes to deep water, unless a man be a good swimmer it were wiser for him to remain on the bank and watch the fight until he can see his way to a dash at his quarry on the shallows. The stag uses his fore-feet with terrific force, and I have seen strong seizers

["WHEN, SOONER OR LATER, HE STANDS TO FIGHT IT IS GENERALLY IN SHALLOW WATER TO BEGIN WITH.—Picture.]

almost cut in two by them; while with his hind-feet he is as quick and handy as a pony. Now for the story of the fighting stag.

It was on the 11th of June that four of us met on the Horton Plains: Maitland (the Master), Ross, Wilson, and myself. The morning was fine, and we left the kennels at 5·45 a.m., but it was too windy to be called a good hunting morning, as it was almost impossible to locate sound accurately.

Seizers having been placed, Maitland with a short pack of about eight couple drew in along a low ridge of thick forest running parallel with the

river. A stag had been harboured there the day before, so we were certain of a find. Just above Figure of Eight Pool the first whimper was heard, and Beauty proclaimed a good find, for immediately afterwards the hounds went away with a fine burst of music.

[A TYPICAL "PATANA" OR OPEN DOWN OF SHORT, COARSE GRASS.—Picture.]

Crossing the river and still keeping along the valley, Ross, Wilson and I ran down the open, keeping in touch with the pack now tonguing merrily on our left and making for a narrow belt of patana into and almost through the jungle above us. Here two seizers, Dainty and Vengeance, had been placed, as the stag was pretty sure to cross it on his way to Baker's Falls, where he would probably make his first stand, or, at any rate, cross the river there.

We reached the belt of patana just in time to see the tail hound flash out on to the grass, and just below us in the hollow we could hear a "bay." Before we could get to it the stag broke bay and dashed into the forest, heading for the falls. We could just catch a glimpse of a nasty red gash on the off-shoulder of Dainty, the fast kangaroo hound, as she passed us, and following we heard the whole pack racing down a precipitous slope to the top of the falls.

Getting over the top of a knoll, in front of us we could hear a grand "bay" going on in the river some 200 feet below us. We were tumbling down the patana side to this when the "bay" ceased, and a big, heavy stag passed in full view on a bit of swampy ground on the other bank of the river. Hounds were close at his heels and, after a momentary check in a stream down whose rocky bed the stag had trotted knee-deep in water, they dashed into the jungle on his line. A second later, amid a chorus of music, a fine stag trotted back into the open, apparently from the very middle of the pack. At the time it appeared that he must be the hunted stag, but subsequent events proved that this was not the case. Not a single hound came out on his line, and he was soon out of sight again in the jungle.

In the meantime we could hear hounds getting away up the opposite slope now in thick forest; but the noise of the wind and rushing water made it impossible to locate the sound. The "field" now divided, Maitland and I following the direction the pack had started in, whilst Ross and Wilson, thinking hounds had turned right-handed, made the best of their way in that direction. After a sharp run of about three-quarters of a mile to Onion Patana, with nothing but instinct to guide me, I heard far away in a thickly-wooded gorge a distinct baying of hounds. So, getting into a game path by the edge of the stream, I ran along as fast as dense undergrowth and trailing creepers would let me, and after going about half a mile all sound ceased.

THE FIGHT IN MID-STREAM COMMENCES.

The stag had again broken "bay" before I could come up with him and, swinging round left-handed up a narrow gorge, he soon took the pack out of hearing. Coming back to Onion Patana and disturbing on my way a large troop of Wanderoo monkeys, whose bark or grunt is sometimes uncommonly like that of a wild boar, I met Maitland. He had heard no tongue, but had picked up two couple of hounds that had been thrown out in the run. Around us the forest trees swayed in the wind, and occasionally the note of a distant bird or the wail of chafing branches would make us start with hope that we heard hounds running. The jungle was sodden with last night's rain, and by this time I was wet to the skin, so that standing still in the cold wind was not at all to my mind.

"THE STAG WOULD REAR HIMSELF UP ON HIS HIND LEGS."—ENGRAVING.]

We decided to return to the open plains by the way we had come and so get to the river as quickly as possible. The hounds we had recovered had evidently come from a high, forest-clad ridge rising some 600 ft. between us and the river. To get round a spur of this was now our object, and we had hardly entered the forest for this purpose when to our joy we heard the welcome sound of a "bay" far away below us, and again in the direction of Baker's Falls. Making the best pace we could, we were soon out on the open patana again.

Now the baying of hounds became more and more distinct, and forcing our way through the fringe of long grass and brambles, always to be found where jungle and patana meet, we gained a view of the river. Here a lovely and striking picture met our view—a long, broad reach of water extending to the very lip of the falls, and broken here and there by ridges of rock and rapids and intervening pools.

In one of these, out in the mid-stream, stood a magnificent stag at bay. His head was lowered to below the level of his withers, and his mane bristled with rage. Taking advantage of every favourable feature in the surroundings, the hounds approached him, baying furiously from ridges of rock, from the bank, and more venturesome ones from the water itself, all in a grand chorus. The stag was in fighting trim and fighting mood, and at frequent intervals with a bound or two forward he would rear himself up on his hind-legs and with lightning stroke his hoofs would break the water with a splash above or within a few inches of an approaching hound. To avoid his terrific and sudden attacks the old and experienced hound would allow himself to sink beneath the surface, whilst the water would break the force of the blow. So far only the leading hounds were up, and no seizers. We knew it was useless to expect to keep him at bay for long, or kill him with only half-a-dozen foxhounds, so the situation was becoming critical.

The master then blew his horn, giving his signal to the dog-boy to bring the seizers, and after many anxious minutes, during which the stag was fast getting his wind, first one and then another appeared in the distance galloping to the 'bay.' A few more hounds had come up on the line, and the bay became louder and louder as they joined in.

Then down the steep slopes to the river came Venus and Strathspey, Rover and Dainty, with Vestal, Vengeance, and Victor, Slavin and Rufus—a truly formidable band, all racing to join the baying pack. In a moment the situation was changed.

The hounds took heart of grace from the plucky seizers and leaped from rock to rock, whilst the latter splashed through shallow pools and, bursting through scrub and grass on the bank, soon showed the stag he had more formidable opponents to deal with than a few baying foxhounds. In a moment the stag broke his 'bay' at once, and with a few bounds was across the river and once more in the sheltering jungle.

The pack, now almost all up, pressed him fiercely, and raised such a chorus on his line that even the roar of the falls and the noise of the wind could not drown it. They hustled him along through the dense forest, and now he tried a desperate move to baffle his pursuers. We were on the very top and brink of the falls, and Maitland waded across the pool just above where the stag had made a short stand, whilst I waited, expecting he would run a short ring and return to the same pool to continue the fight. Leaving the falls for a moment, I could hear hounds getting lower and lower, baying as they went.

It was a frightful bit of country. The falls are broken into three steps or ledges, with a deep pool worn into the solid rock, into which the water plunges with a roar. The first fall is some 25ft., on to a narrow ledge, thence, after a swift swirl in its water-worn basin, it spouts out again over another 15ft. of rock on to a broader ledge below. Above, the river has divided so that, while half of it descends to the narrow ledge I have just described, the other half falls sheer over some 30ft. into a deep, dark pool at its base. On either side of these falls and within the influence of the water are perpendicular cliffs, from crevices in which magnificent tree-ferns lean their graceful fronds towards the spray.

It had now become evident to me that there was no chance of the stag ever reaching the top of the falls again, and the sound of hounds could now only faintly be heard through the roar of water. Crossing with the greatest care over the very brink of the precipice, where a false step or a slip would have meant certain death, I reached the other bank, and forcing my way through dense undergrowth away from the falls I could again hear the furious baying of the pack now far below me.

Looking over the edge of the precipice, which extended into the jungle from the river, I could see Maitland lowering himself by saplings, roots of trees, and trailing creepers into a perfect chasm. But the baying of a pack of hounds and a fighting stag will lead a man anywhere, and down I went hand under hand, hanging sometimes directly over Maitland's head.

Just as I reached the bottom, drenched and almost blinded by the spray of the left-hand fall, I witnessed an extraordinary sight. On the brink of the fall in one living, struggling mass were the stag and two-thirds of the pack—the stag with his feet in the air and Rover fast on his ear. The good old hound had made his seize with such effect that the shock and the slippery foothold had turned him over. It was only a momentary glimpse, for at that instant the whole lot of them went over the fall together. The force of the stream and the narrowness of the ledge gave no chance for a single hound to avoid it.

Following Maitland, who was the clambering down the side of the fall, through pools and over boulders and down another wall of rock, we reached the second pool. Here the stag had reached his last stronghold wherein to make his final effort, and a gallant effort it was. The depth of the pool into which he had fallen had saved his life for the moment, for he had somehow crushed poor Rover in his fall. He lost no time in making good his advantage. The ledge of rock here was much broader than the one they had just left and the rocky basin was some 40ft. long and 20ft. wide. From this there was only one way out except over e falls, for on the far side rose a spur of some 50ft. whilst on the right was the fall and left the lower fall.

The rest of the field here joined us, coming down the face of the precipice where a few shrubs and saplings grew. Now the fight began in earnest. It was a grand and awesome sight that we looked upon. From above us the upper fall plunged down into the deep, dark pool at our feet with a thundering roar, and clouds of spray rose into the air around us. At the tail of the pool, and on the lip of the lower fall, in the fierce rush of the descending torrent stood the stag, facing the pack, as the bolder ones dashed or swam towards him. Below and behind him no living creature could have gained one second's foothold.

[THE MASTER SOUNDS HIS HORN AFTER THE KILL TO CALL UP STRAGGLERS.—ENGRAVING.]

[HERE IS A UNIQUE PHOTOGRAPH SHOWING TWO HOUNDS ABOUT TO ATTACK A STAG AT BAY IN THE STREAM.—ENGRAVING.]

The water from the pool confined in its narrow, worn channel rushed with swirl and eddy past him, breaking over his hocks, but barely reaching his knees. To reach him here with the knife was quite impossible. Over a sheer wall of rock the fall plunged with a reverberating thud into the pool some 30ft. below—a solid rock cauldron of black, seething water.

The gallant stag here held his own and gained his wind once more. Hound after hound, feeling the danger of the stream and fearing to face the stag in such a place, came away to adjacent rocks and ledges to bay their feelings to the full. But Venus, a grand white deerhound, was not to be denied. With the courage and recklessness of the best of her race she made her spring to seize, trying for the ear as Rover had successfully done in the pool above; but she missed her point. In a second she was drawn into the vortex of the deadly rush of water, and in another she disappeared like a flash into the pool some 30ft. below.

It was a sickening sight for her owner—indeed for us all—to see this grand hound whirled down, out of sight even before she was well over the cruel fall. Her attack, however, dislodged the stag, and forward he bounded once more into the safer environment of the pool. But other hounds encouraged by the good seizer's effort, had ventured too far out in the stream, and in a moment, one after the other, Beauty and Rosebud—a splendid couple of foxhounds—and Rufus and Pillager were swept past us over the fall. Another good hound followed and then another, and two were saved on the very brink.

Now hound after hound dashed in to seize, only to be pounded by the stag as he stood on some submerged rock ss a point of vantage to meet his foes. Wilson sprang in at him knife in hand, but missed his point behind the shoulder, merely grazing the skin.

With all one's clothes it was no light matter to swim in the swirling eddies near these grea falls and it was with some difficulty that he ret gained the ledge of rock from which he had jumped. The stag in the meantime, startled by the sudden plunge and the prick of the hunting-knife, swam immediately under the fall, and as he paased under the torrent of water he threw his head back and seemed to lift himself away from the suction of the under current, which must have been very strong where the fall met the pool.

Coming round to my side, where I guarded the only path out of the pool to possible freedom, he faced me quite undaunted and walked calmly right up to the point of my knife as I stood on a ledge of rock level with the water. I knew I could not reach his heart with my knife in this situation, even if I had plunged straight in, and he did not consider it advisable to approach any nearer. A few hounds dashed in again and some of those still swimming tried to seize, so once more he swam across the pool.

Wilson then made a second attempt, and this time the under current seemed to draw him down ; it was only by the greatest effort that he succeeded in clambering up to the ledge once more.

Dainty, in spite of the wound on her shoulder she had received at the first short "bay" on the patana, here seized magnificently, and over and over again had the stag by the ear, but the water was too rough for her. The stag would sink or even dive to choke her off, and invariably succeeded in doing so. Vestal, one of Venus's fine litter and almost a puppy, was barely a moment on the bank; and Blithesome and Reckless, two fox-hounds, went in over and over again most pluckily, but against them all the stag held his own most gallantly. We, too, were not idle, making a dash here and there as he seemed to expose himself to attack; bnt as often he eluded us, At last after an hour's fight Ross, taking an advantage of a fine bit of eeizing by Vestal and Dainty in the shallow channel between the pool and the lower fall, got his kuife into the heart. Our qnarry was a fine stag, and must have weighed fully 30st. clean ; a better fighter I have never seen. Having dragged the carcass ashore and performed the usual offices, the hounds were duly rewarded as they so well deserved.

We now turued our attention to the wounded andmissing. Of the six hounds that had gone over the lower fall Venus, Beauty, and Rosebud had joined us. How any living creature could survive such a fall it was impossible to imagine ; but all three took part in the "bay" again, although it must be confessed with ardour somewhat damped by their descent into the pool below.

Three hounds or more were still away and we feared the worst, but poor old Rover claimed our first attention. He seemed in a very bad way, indeed. While the "bay" was going on we nad noticed him for some time perched on a boulder shivering and taking no interest in the proceedings; as we moved away to reach the open we realised how bad he was. He staggered and fell on his side, and seemed quite unable to move. A little whisky was poured down his throat, and he was at once carried to camp; but when we reached home an hour afterwards he was dead. Welkin, one of the fox-hounds, was badly pounded at the beginning of the "bay." The stag had caught him fair on the back and temporarily injured his spine. It was hours before he came round, and weeks before he could leave the kennel again. One or two others had bruises and slight wounds, but none of any consequence. Venns was injured going over the big fall, and for sometime showed signs of injury. We found the rest of the missing ones shivering on the sides of the pool—two of them so placed that another plunge into it was necessary before they could reach us.

CAOUTCHOUC FROM THE CONGO.

WHENCE OBTAINED—PROTECTION AND FOREST CONSERVANCY—VARIETIES OF CAOUTCHOUC—PREPARATION OF THE JUICE—PROPAGATION—MULTIPLICATION—PLANTING.

(RUBBER.)

Almost the whole of the caoutchouc exported from the Congo is obtained from climbing plants of the genus Landolphia, and some other Apocynaceous plants. Caoutchouc from some species of Ficus appears sometimes on the market.

The authorities of the Congo State have wisely decided that so valuable a product as caoutchouc should be protected from the inroads of traders and of natives, and that the trees should be carefully cultivated. King Leopold signed, in January, 1900, the necessary documents for the institution of a "Service de Controle Forestier."

This institution is of great importance from an economic point of view, and I may mention that the first results obtained by it have been highly satisfactory.

According to the regulations it is ensured, under the superintendence of this forest-service, that every individual who collects caoutchouc be by law obliged to propagate either the Lianas or the trees yielding the rubber, according to the discretion of the superintendent of the district. Therefore societies of growers (and they are numerous in the Congo States) have so well recognised the profit obtainable by working on a large scale, as the new State regulation requires, that they expect a bright future, and have despatched many specialists simply to re-stock exhausted forests, and to increase the riches of the others. It is certainly remarkable in colonial annals that a regulation, made in January, 1900, and confirmed in March, should not merely be in action within that year, but that important Liana plantations should within that short time be under the control of the appointed agents.

Already the plantations in the equatorial district (among others) include 3,000,000 of these Lianas. When in September, 1897, I left the Royal Gardens, Kew, for my duties in the Congo State, there was but little said concerning any extensive crops in equatorial Africa, except Coffee and Cocoa. Cultivations of Rubber-plants has come up wholly in the last two or three years.

VARIETIES OF CAOUTCHOUC.

In congo there are four very distinct caoutchoucs of the Landolphia genus, besides the "des herbes" species (Carpodinus lanceolatus and Clitandra Henriquesiana, an allied genus), and three other species imperfectly determined. The "des herbes" Caoutchouc is well-known. The difficulty of collecting the rubber, and the impurity of it, renders it of little use. The other species are quite distinct; the one is white, the second is black, the third is rosy.

The white caoutchouc (called by the natives Matofemongo, and by other names, according to the village in whose vicinity it is procured), is a vigorous Liana, whose stem rarely measures as much as a foot in diameter. The fruit is round, and from about the size of a green Walnut to that of a large Orange. The skin is thin, slightly wrinkled, violet when young, yellow-red or bright-red at maturity. The fruit contains from ten to thirty-two seeds, each surrounded by hairs, and

filled with sugary-acid juice. The whole resembles yellowish-white mucilage, This is probably Landolphia ovariensis.

The rosy caoutchouc is probably a varicty of L. ovariensis ; it also is a sturdy Liana, the stem of which is sometimes 6 inches in diameter. It bears small, pyriform, yellowish-green or reddish-green fruits, with, at maturity, a "nubly" wrinkled skin, and containing from four to twenty seeds, surrounded with yellowish-white hairs filled with acid juices. This yields the most valuable rubber ; specimens quoted 4s. 5d. per lb. Native names for the plant are Bongow, Mongew, &c.

Black caoutchouc (Mondongo, Boole, &c.), or Landolphia florida var., is a sturdy Liana, the stems from 4 to 6 inches across, bearing round fruits, easily recognisable, as the seeds are surrounded with a blood-red viscous pulp. They number from four to ten.

The Congo caoutchoucs are remarkable for their purity. The natives coagulate the milk either by precipitation in boiling water, or by the addition of a very acid juice, which at once incites the collecting together of the molecules held in suspension in the milk. Thus are both the white and the red caoutchouc coagulated immediately by the addition of juice from a plant known in all the equatorial regions as Bosasanga, the Costus afer. A fine specimen, brought from the Congo in 1896 by Professor Laurent, of Gembloux, is in the Victoria Regia house at Kew.

The rubber of the black caoutchouc, however, is not influenced by this material, and is only coagulated by precipitating it in boiling water. It is ignorance of these facts that cause the production of inferior rubber. For instance, if the native gathers in his calabash the white and the black rubber, and submits them to the influence of the Costus juice, the white rubber coagulates, and includes the molecules of the black rubber with it, but remains always more or less viscous. Similarly, if the mixture is precipitated in boiling water, the black rubber coagulates immediately, but as it encloses the white, the mass is depreciated in value. Thus merchants recommend that the different kinds be collected separately. Other natives, instead of percipitating the mondongo in boiling water, simply boil the milk, thus forming a porous and elastic mass. Coagulation with Costus juice is practised thus: the milk flowing from the incisions is first collected in leaves left under the cuts, then gathered into calabashes and taken to the village. While one man cuts the Costus canes and strips off the leaves (it is a somewhat shrubby plant, sending up suckers from 3 to 6 feet high, and from ½ to 1 inch in diameter), another man passes a piece of Banana leaf over the fire, rendering it wonderfully supple. A small hole is made in the ground in which the Banana leaf is laid and the milk poured into it. Three or four canes of Costus taken together are twisted above the milk, which coagulates immediately under the action of the acid juice. With the hands it is made up into a ball and firmly pressed uutil the rubber is all extracted.

It is noticeable that all caoutchouc coagulates naturally by simple evaporation if left in shallow vessels in airy and shady places. The product thus obtained is absolutely pure.

The caoutchouc Liana is found in all equatorial forests, whether these are inundated or not, and be the soil clay or sand. In the Congo (according to the botanist E de Wildeman) are found Landolphia Hendelotii, ovariensis, Kirkii var., Klainii, lucida, florida, and florida var. leiantha ; Carpodinus anceolatus, turbinatus ligustrifolius, leptanthus; Clitandra gracilis, myriantha, Mannii, Schweinfurthii, visciflua, and cirrhosa.

Several ways of propagating have been tried, as by cuttings, layering, collecting seedlings, and seed-sowing. Cuttings are not successful except when managed by practised hands, under glass, and where there is bottom heat. I have seen thousands, and not one has rooted. Layering on a large scale is not practicable, as it is too slow a method.

As regards the collection of seedlings it should be said that the ripe caoutchouc-fruits fall from a great height and generally break in so doing. The seeds retain germinating power but a short time, and owing to the very moist atmosphere of the undergrowth they germinate all together in the fruit, so that the fruits must be collected and the young plants separated. This task must be perforce trusted to natives who would gather the whole of the seedlings beneath the trees, and so they would exterminate the young plants found in the forest.

The chief propagators of the caoutchouc Lianas are the apes who swallow the ripe fruits whole, and the undigested seeds germinate perfectly afterwards. This I discovered through a native, when I asked him if certain species did not grow in dry as well as in inundated forests. He replied, "Do not the apes climb all the trees." Another unconscious planter is the native who is also fond of the Liana fruit, so that frequently near a village small plantations arise full of caoutchouc Lianas accidentally established there.

MULTIPLICATION.

To turn from these casual acknowledged methods of cultivation, it may be said that the rubbers grow best from seed. The nursery must be made in the forest in a space between fine trees that is large enough for the formation of several borders. No tree must be cut down, and there need be no large plantation in any one place. The borders must be fenced but not roofed as the trees around afford sufficient shade. Each border should be about 3 ft. 6in. wide, and of any preferred length, and several borders may be divided by narrow paths. If the ground is sloping, the length of the border should be parallel with the slope and the plantation should be surrounded with a ditch, to keep the seeds from being washed away. The nursery can only be established when the fruits are ripe unless the soil is not in a fit condition for the seed to be sown.

Fruits brought in by the natives are at once opened and seeds are sown singly, thrusting them with the finger half an inch into the soil and each seed half an inch to an inch away from its neighbour. I insist on the immediate sowing of ripe seed, as dry seed is useless. Unripe fruits become ripe if stored. Germination generally ensues in a fortnight and when the seedlings have eight leaves they are easily transplanted. Seed in the nursery grow equally well as that *en place* ; the fruits remain ripe for two or three months only. It is, therefore, advisable to gather as many as possible to be sown in an allotted space in the forest prepared for them.

PLANTING.

The nursery-ground made and the seeds planted, the space to be allotted to the Lianas is marked out in plots of (say) 24 acres. A central avenue is

to be made as straight as possible, and about 16 feet wide by half a mile in length. Of course, not a single tree should be sacrificed, only small branches being removed. Further straight walks are made every 650 feet, measuring 16 feet wide and 1600 feet long. Thus are obtained plots of about 24 square acres each. If the forest is a very fine one, this area may be doubled.

When seedling plants with eight leaves are ready for moving the men prepare a place in the forest with their hatchets, cutting down the undergrowth but leaving all trees, old and young. They remove just enough brushwood to enable them to reach the foot of the trees. Experience has shown that 100 men can in a day prepare twenty-four acres of standard forest (haute futafe) suitably for the reception of Lianas. The forest is well adopted to a nursery ground and is worked with a short-handled shovel, with which the Lianas can be transplanted without injury to the roots. The planters take with them vessels of water into which they trust the roots of the young plants. These pots, full of a certain number of specimens, are taken to one of the prepared squares and there, with a dibber or shovel, little holes are made round each tree for a specified number of the plants, which are set in up to their first leaves. The number of each group varies from two to twenty according to the size and shape of the supporting trees. These trees are not so much to prop as to arrange the Lianas, which might otherwise choose a resting place more than 300 feet away. The plants are set some 12 to 20 inches from the foot of the trees, not in the fibrous earth generally found there to a certain extent but in the actual and firm natural subsoil. Thus there is a minimum of about 2500 Lianas for every 2 acres. After planting the ground is supervised for two months, and when the grower has replaced any dead plants and is certain that all are doing well, the forest is left to itself ; in this consists one secret of caoutchouc growing. The plants require stagnant air saturated with damp and should be disturbed as little as possible. They should be allowed to ascend to the tops of the trees and after some years form a thicket impenetrable to the sunshine, thus destroying all the underwood. It is absolutely necessary to institute organised surveillance to guard against the depredations of natives and of animals who might destroy the trees and form new paths. No other precaution is necessary.

There is much difference of opinion as to when the caoutchouc may fitly be collected. I am disposed to say that the plants should not be disturbed before their tenth year.

The question of the number of Lianas to be planted to every 2 acres has little importance; from 2,500 to 5,000 is a fair estimate. Perhaps in the course of a few years some improved method of extracting the caoutchouc will be discovered, for, if all the rubber could be drawn from the tissues of the bark and leaves, the yield would be trebled.

It is in the above-mentioned manner that we have, in equatorial Africa, established trial-grounds on the scale of 10,000 plants per 2 acres on 74 acres of the forest. Wherever this industry may be started, it will be found indispensable to keep strictly to a detailed plan on a scale of 1 to 5,000, for instance, made of the ground under cultivation. Guide posts are also to be recommended for use in forests thus utilised. *Louis Gentil, Inspecteur Forestier de l'Etat Independant du Congo.—Gardeners' Chronicle,—* April 27.

SPORT IN DAYS OF OLD.

AFTER ELEPHANT IN BALANGODA JUNGLES

BY H. B.

Dunraven Estate, Mlanje, British Central Africa.

It was in the year 18—when living at Ratnapura, Ceylon (in the most relaxing, hot, wet, and steamy climate in the world) that I was pining for a change but did not know where to go. So a happy thought struck me, viz., "write to old J M —get up to an elevation of about 3,000 ft. above sea level, recruit my lost energy, and have some sport at the same time"; for I heard there was a

ROGUE ELEPHANT

near J M's estate, which should afford good sport ; for the beast had the reputation of having hunted many a Tamil cooly, and being accountable for the death of a few, on a lonely path which had to be traversed by the labourers on their way to Balangoda bazaars for their weekly supply of rice.

This huge monster was said to be both deaf and blind, but his sense of smell was keen and he had hunted down his victims like a bloodhound : his age was guessed to be great by his enormous size and the fact of his having large white blotches all over his body,—particularly about the head, ears, and neck. A reward of R50 was offered by the Government for the destruction of this reputed rogue, said to be then in the neighbourhood of Bambarabotuwa, not very far from Adam's Peak.

Although I was bent upon shooting a rogue elephant (for which no license was required) ; in case of meeting others during my forest rambles I decided to obtain a license for one elephant, and also a license for shooting other game. So I proceeded to the Government Agent's Office, and obtained the documents necessary to save me from being run in by any officious village headmen, who are always ready to report any and every European shooting in their neighbourhood, whether licensed or not, although those officials always overlook and share in game shot without a license by natives in their district.

Well, my horse-keeper had orders to get ready for the road at 5 a.m. next morning, and my appu to have everything else prepared for a fortnight. By the appointed hour I was up and soon trotted along the road as far as Pelmadulla, where there is a Government Resthouse, 12 miles from Ratnapura. Here I intended to stop for only a few minutes to see an old acquaintence and get the news. I was told by my friend that I must stay breakfast, as he had an elephant yarn to tell me; of course, anything about such noble sport, especially as I was bent on shooting the notorious Bambarabotuwa rogue, was sufficient inducement for me to stop, although I fully intended to get along another nine miles or more.

Meantime my friend called for whisky and soda for two, by way of an appetiser to the yarn he had so often repeated to others before me, and which by the way I had, second-hand, heard myself. He began, "You know, B—, the

INTELLIGENCE OF ELEPHANTS

is past my understanding. Y — and myself were after a herd in that belt of forest in R—district just above S — estate (there were four in the herd) last month. I managed to get up to within 20 yards and Y — was close behind me, when one of the beasts turned round and deliberately walked towards me. Although dead with fear, I fired and down went the elephant ; no sooner was he flat on the ground than I was behind him and out with my hunting knife, this very knife you see in my belt, and off with his tail before you could say Jack Robertson. Meantime Y —had fired, and I went off to see what luck he had. Upon my reaching the spot, he shouted, 'Come along, old chap, and let us drink to the bag." So up we scrambled on to the top of the carcase of Y.'s fine bull elephant, killed by one bullet in the temple. Z—had got his tail too and we stood together and emptied the flask between us, oh ! so proud of our tails. I soon set to work to cut off the elephant's feet with the assistance of my gun-coolies ; meantime Z—went off to do the same but had not gone many minutes when he returned to say the other dead elephant was "non est," would I come and see for myself. I went and sure enough there were only the marks of the beast having fallen ; nothing else but blood from the bleeding stump of the tail was to be seen.

We got the feet of one beast carried down to the resthouse, and I have with others been so chaffed by Z—about the tail that I cast it away and hardly ever mention elephant-shooting now. The coolies were sent next morning to bring the ears of the dead elephant but they returned with a yarn that the herd had returned during the night, carried away their comrade's body and thrown it over a precipice where they could not go ! "

By the way when

COCONUT PLANTING

was first started in Jaffna the elephants were so destructive, nipping off the tops of the young trees, that a reward was offered by Government for their destruction.

For some time great numbers of tails (which was all that was required of the beast's body to lay claim to the reward) were brought in to the kachcheri ; the reward, of R5 I think, was always paid up, till it became known that large numbers of elephants were to be seen tail-less. The order was issued immediately to bring elephants' heads before any reward would be paid, but very few heads ever came in from Sinhalese guns although they were expert enough at cutting off tails.

Upon resuming my journey after a good meal, I began to ascend the zigzag approaching Balangoda ; the air became so bracing and cool that it made me feel a new man after the sweltering heat of Ratnapura. I soon reached my friend's estate where I found a welcome and the hospitality, which planters have the reputation for, was liberally extended to me. After a few days rest, I felt as fit as ever and, with the permission of my host, I got ready for a start in pursuit of the rogue elephant. Coolies were mustered for carrying our belongings and we were soon on the footpath leading straight up to the forest where the rogue was said to reside. M—pushed through abandoned coffee estates as if walking for dear life, which was more than my feelings could stand, for I had not the iron limbs, broad shoulders, and expanded chest of a coffee planter ; so I called a halt, and sat down shouting to M—to join me in a bit of luncheon, or I would not and could not go any further that day. We sat down, had a sandwich and a drop of the 'crathur' and made another start soon after. M—began to yarn when he saw it was no use trying to pump me and said, "Do you remember B—?" "Yes" said I. "Well, he shot a cooly for a wild-boar on the face of that hill when out

ELK HUNTING

with me some 10 years ago, and it was never found out what became of Ryapen of H—estate. Of course I knew but I never told anybody but yourself before. B—is now in Australia." From early morning till nearly sunset we walked over hill and dale, M—keeping me up to the mark by yarning about old H—and M—estates, gem mining, &c. in days of old, till we reached a woody piece of open patana grass-land in the middle of virgin forest." "Here," he said, "we must camp for the night." My reply was, "But how much further have we to go for the rogue ?" "Oh, no distance from here," said he, "we are sure to hear him trumpeting during the night."

For several years past I had been used to a sedentary life, and right glad I was to cry halt for the day. After a tub and some lunch, whether due to the keen mountain air or the food I cannot say, but I never felt better and suggested fishing, and off we went followed by our coolies to a large pool in the stream which was full of fish. A couple of dynamite cartridges, with a stone to sink them attached, was thrown into the pond, resulting in a grand haul of fish, about half a bag full. After all were collected, we returned to camp. Some good sport was got following and catching wounded fish in the pool which were only stunned, and dived whenever we tried to catch them, added to the difficulty in holding the slippery things when we did close on them. We found the best way to catch them was with both hands or by the gills with one hand ; but one must be an expert swimmer with the feet to be able to use the hands freely at all.

Sportsmen, when out for a short time will find it a good plan to put up a few dynamite cartridges, with fuses and detonators, for fishing in time of need, but one must be careful not to get in the way of the smoke from a cartridge in case of a severe headache, caused by the nitro-glycerine burning ; further, wait for no hints from your friends as to the best place to throw the explosive, (as I heard of a man doing once till his hand was blown to pieces) but decide beforehand, and throw the charge as soon as the fuse is lighted.

We turned in early and I heard M—giving orders to the boy to have tea ready by 4 a.m. and to wake him sharp at that hour, first cock-crow. It was quite dark and abominably early and cold, when I heard "Boy ! Boy !" and a rattling of a bucket or basin in lieu of a tomtom. "Yes, Sar," shouted the boy. "I said I wanted tea at 4, and there is daylight. What the d——I do you mean ?" and whizz went a boot. "Sar," roared the boy, "toast and tea nearly ready. Now coming, Sar." When I found it impossible to sleep after repeated attempts I got up, and I found M— ready dressed for the road and still blackguarding the servants. Early tea over,

WE STARTED

along a narrow foot-path through dense forest with a beastly matted undergrowth of bamboos which had fallen on the path in places, making it most difficult to get along at anything like a couple of miles an hour. The heat had now become terrible. Owing to the labour of getting along in a stooping attitude, the perspiration was pouring out of us both. I vowed I could not go on another 20 yards but M——kept on at the heels of Muttusamy for fully half an hour after this without paying the least heed to my protestations. His locomotion at last seemed to slow down, and finally stopped dead. Crawling up, I whispered "what is it?" "Look here," said he, "the finest tusker in Ceylon." "How do you know?" was my reply. "Just look at the shape of his foot, it's not round but long ; tuskers have feet always shaped different to common elephants." "What is to be your move now? Shall we sit down and have some refreshment or go on ? " Go on, of course," said he, and off he went and I after him as fast as my legs could carry me till I got hold of his coat tails to stop his fearful rate of locomotion. I said, " Better wait for the coolies with spare guns as we may stumble upon the rogue at any moment" as the spoor looked quite fresh and, besides, we were running great risk which M— did not seem to see at all. The guns arrived and I whispered to Ramasamy to keep close to my heels with my 577 double express. Although I knew the least danger would send him flying up the nearest tree, my gun would be handy if pitched on the ground or stuck up against the nearest tree. I was carrying a Martini sporting carbine, and M— had a double 12 rifle, and a cooly carried his No. 8 bore. His son, a lad of about 18 years, was armed with a 12 bore rifle.

We had not gone very far when a large open space with steaming elephant's dung was found. My heart throbbed against my side when I saw M— making a move and pointing in front of him. I could see nothing but jungle. Up went his hand pointing in another direction. Suddenly some

HUGE FORMS

caught my eye, great black objects like so many rocks. I moved nearer to the living monsters, to within 10 yards. I saw M—. moving along the path in front of me, clutching his rifle evidently intent upon shooting something. My beasts began to shake their legs and ears about, and suddenly one wheeled about as if by magic on his own axis. My rifle was up and Bang ! Bang ! and slowly one sank to the ground never to rise again. Screaming, trumpeting, and swaying of trees in every direction went on for a minute, and all was still again, till the silence was broken by the ring of M's rifle. I heard a shout " Look out, he's charging." I turned round to look for my 577. Of course Ramasamy was safely perched upon the top of the biggest tree in the neighbourhood. I ran along the path and picked up my rifle lying right in the middle of the road where the rogue was bound to pick it up and smash it to pieces. I just got hold of the weapon when "Shoot, Sandy, shoot! Somebody shoot !" rang in my ears. Upon turning round I saw Sandy (who was between me and his father) fire at the rogue (who was in full charge after his father) right over the old man's head, and on they came, father and son, pursued by the elephant. How I kept steady and waited till M— and his son ran past me, without running myself, I hardly know. However, there I stood, a few feet off the path till, M— was within ten yards of being seized by the beast's trunk, when I fired and down went the rogue crushing the scrub like straw under him, killed by a small bullet instantaneously. M— looked back when he heard my shot, followed by the crash of the falling body, many tons in weight, which struck the earth all around. M— gasped, "is he dead ? look, he'll be up, his sides are moving, give him another shot!" which I did, but not a move was in him except that described above.

My remark to M—, when all the commotion was over, was, " I saved your life, then, old chap; for he nearly had you by the tail of your coat " " Oh no," said he, "I had my running legs on." I smiled, and he looked very angry, so I said nothing more but " come and let's drink to our good luck," and we did with good relish after cutting off the tail to make sure of this ever-coveted trophy.

To stand still

WHEN AN ELEPHANT CHARGES

till he gets within 20 or 30 feet, and then clear out of his way is much safer than running, being pursued by the infuriated animal, as he is sure to catch any man either in the open or in jungle, forest or scrub, but when in full charge and the object of vengeance has disappeared from the line of vision the beast goes on some distance, evidently unable to stop, and rarely returns : at least, that is my experience of a charging elephant. We returned to see my first bag and found a medium-sized bull with no ivory. When engaged examining the head as to the direction of the bullet, crashing through the scrub came a youngster right on top of us, taking us all so much unawares that we fled in every direction, nobody thinking of anything but his own safety, although the calf was only about 4 feet high. We wanted to shoot the little brute when we returned, but I proposed getting jungle ropes and tying him up, and taking him home a prisoner; this we failed to do, however, as nobody could hold him secure enough to get him noosed ; the tail, trunk, and legs were all tried in vain, giving us fully three hours' grand sport ; till at last the little beast made off, deprived of his tail which Sandy cut clean off near the root.

The cause of the trouble with the elephant which M— had fired at, and afterwards charged him, and I laid low, was in defence of her calf. We never saw the rogue elephant on this occasion, and were satisfied with the two we had bagged.

M—— declared that the shot he fired was at my

FIRST ELEPHANT,

and not at the cow which charged him and became positively furious on the subject, setting to work with his coat off and shirt-sleeves turned-up to cut the head off, to find his bullet in proof of his assertion ; the bullet was found buried about two feet in the head nearly escaping at the neck, and proved to be my 577 solid express. M—'s mouth dropped and his features changed and we retired to camp at the stream for the night.

Next morning large slabs of skin were cut from a carcase and the feet removed, the former to make a table, and the latter to be dressed as work-boxes, footstools, &c.

M—— was a well-known Shikari, a splendid shot at all kinds of game, and as fearless and determined an elephant hunter as ever lived. It

was he who was selected to go into the kraal, held at Labugama, Ceylon, for the young Princes in 1886, and shoot the mother of a young calf, which almost spoiled the whole affair by killing natives, &c.

A cow elephant with a young calf, a cow and bull elephant together, and a single bull, usually a rogue, are always dangerous to sportsmen; at least, I have always found it so.

CACAO CULTIVATION IN CEYLON. (MAY 1901.)

In July 1898 the estate returns showed a total of 21,260 acres under Cacao; and in May 1901 the aggregate, worked out, amounts to 23,696 acres, or an increase of 2,436 acres. But this is apart from native gardens of 50 acres each and less, of which a special separate list has been compiled, showing a total in cultivation of very nearly 9,000 acres. We have therefore a grand total under Cacao Cultivation in Ceylon, of all ages and conditions, equal to 32,600 acres. Seeing that our heaviest export hitherto has been 42,745 cwt, it is quite clear that a large proportion of the acreage must be very young or in very poor bearing; for we should hope that when all the trees are mature, and the fields and gardens properly cultivated, our export should reach to 100,000 cwt. This would not average much more than 3 cwt an acre, which we suppose can be readily harvested from every properly planted and cultivated plantation. There are, however, enemies to reckon with, and successfully overcome: as these may be under the Cryptogamist's directions, we do not suppose that the bumper crop we refer to can be anticipated for five or six years to come.

One thing seems very clear, that Ceylon can never be a leading Cacao-growing country,—can never attain, for instance, the position of Trinidad, which is officially credited with a yearly crop exceeding 200,000 cwt.; and still less that of Ecuador, which annually exports 500,000 cwt., or nearly one-third of the world's requirements. Ceylon Cacao planters have, at least, the consolation that their product is not likely to be overdone in this Island, in the sense in which Tea is supposed to be already overproduced. What they have to do now is to maintain and improve the high reputation of their product; to perfect their methods of curing; to apply (in Mr. Carruthers' words) "more sanitary methods of cultivation" and gradually to improve their varieties of Cacao by selection and other means so as to increase the profit from their fruit trees.—What the Cacao tree is capable of may be judged from the solitary specimen of the Caracas variety growing on Keenakelle estate, Badulla, to which we have so often referred in our Handbook. Mr. Carruthers has found that the tree is about 17 years old, over 22 feet high, with a spread of 30 feet; and for the last five years it has given an average of 434 ripe pods per annum; this is at 3,800 feet above sea-level. Of course, it would be absurd to assume what a plantation could be made to do from this solitary, well-cared-for tree; but still this experience affords some idea, we trust, of what many of our Cacao planters may anticipate as their trees, planted in good soil, grow older and fully matured. —Dumbara, the Matales, Panwila, Kurunegala and Galagedara, and Monaragala are the leading Ceylon Cacao-growing districts, and we do not suppose the Government, if their officers were so instructed and tried their best, could sell another 5,000 acres of Crown land, really well adapted to the cultivation of *Theobroma cacao*—which requires not only rich, deep soil but shelter from wind and good drainage.

ADVENTURE WITH A LION IN CENTRAL AFRICA.

(*To the Editor C. A. Times.*)

Lualaba River, 21-1-1901.

Dear Sir,—I have read with deep interest, and I need hardly say with deep sorrow, the account of Mr. W R Johnston's death in your issue of the 1st December, 1900. He was undoubtedly one of the best sportsmen and shots in B C A.

I narrowly escaped the same fate, this time last year, in the Upper Choma Valley, being

KNOCKED DOWN BY A HUGE MAN-EATING LIONESS

I had severely wounded the previous evening, and which I was following up in terrific grass and "wait-a-bit" thorn trees. She charged and sprang at me almost before I had time to fire, which, owing to the grass, I was unable to do till she showed up about six yards from me. It was a bit —more than a bit—tantalising to hear her roaring (short, sharp, coughing roars) and crashing through the high thick grass, which had been badly burned, and therefore would not burn again, towards us without being able to fire a shot. As she emerged she swerved, and, firing in no end of a hurry at the same moment, my bullet, I fancy, went over her. The next instant my rifle was knocked yards away, and I was sprawling on my back with the lioness on top of me. Luckily, weighing a mere nothing, I had gone down like a ninepin with the lioness's weight and she therefore partly overshot me, only her stomach being on my face and chest. Her foreclaws were busily engaged on the exposed hindquarters of one of my boys who had taken shelter behind me, and who, ostrich-like, had hidden his head in the grass, fondly imagining the rest of his person invisible. My two gun-bearers, each with a spare loaded double-barrelled express rifle, bolted and surveyed the scene from a safe distance, leaving me to see it out as best I could. Neither attempted to come to my rescue or fire a shot. I escaped without a scratch, though a bit bruised and sore about the stomach and chest, but my clothes were torn. The details of this little adventure will appear in my book (if it ever gets as far as being published) so I will not encroach on your space here. One's

GUN-BEARERS

are in 99 cases out of 100 the rankest cowards out in an emergency of this sort, and it is as well for sportsmen to realize that they have only themselves to depend on in a tight corner; that not the slightest reliance is to be placed upon their gun-bearers.

I do not wish foi a moment to say a word in favour of Mr. Johnston's followers, police, etc., but how many white men, let alone natives, are there who would undertake to leave a post of safety to hand a spare rifle to a man in a tree at the foot of which, or at least within a very few yards of which, were two infuriated lions, one unwounded, the other wounded? Not many, I think.

I fully concur in your strictures on

THE SALE OF WORTHLESS AMMUNITION

such as Mr. Johnston was too evidently using, and those who offer it for sale are deserving of the deepest censure. It would be interesting to ascertain from whom this ammunition was procured, so that those who have laid in a supply from the same source could hand it back with the request to be refunded the amount. A couple of years years ago I had occasion to buy in Blantyre, not without great misgivings, however, some soft-nosed bullets for my ·303. My misgivings were justified, for at least four out of six cartridges were misfires. One day I had five in succession and therefore laid my ·303 aside until the arrival of reliable ammunition from my gunmakers,

With regard to the fatal accident to Mr. Johnston, a native told me that the deceased gentleman had come across six lions. One came at him which Mr. Johnston wounded, but was killed by it. The police, he said, then accounted for the remaining five! In conclusion it is always advisable to carry a small revolver—if one has such an article—fastened to the belt at the back. Had either Mr. Johnston, or Dr. McKaye of the *Herald*, or possibly many others who have been fatally mauled by lions or leopards, adopted this simple precaution, the majority would doubtless be living now. Personally, however, I never, by any chance, think of burdening myself with either a revolver or a knife, but it is always "on the cards" that I may one day (but I trust, not before my book is completed) regret not having done so. As regards this bit of advice, it is a case of "Do as I say, but don't do as I do."—Yours, etc, POULETT WEATHERLEY.

—*Central African Times*, April 13.

PROGRESS IN BRITISH CENTRAL AFRICA.

From Mr. H Brown, a former Ceylon planter, we have to acknowledge receipt of a copy of the Postal Guide of British Central Africa, which, from its up-to-date rules, bears evidence of the progress made in British Central Africa. It contains all necessary information and should be carefully studied by all who have any correspondence with the Colony.

TOBACCO CULTURE.

We have to acknowledge receipt, through Messrs. Freudenberg and Co., of a very useful little pamphlet (profusely and well illustrated) on this subject, published by the German Kali Works, 93, Nassau Street, New York City, by whom we are promised other publications, including "Potash in Agriculture," "Cotton Culture," "Principles of Profitable "Farming," and "Farmers' Guide" which we shall be very glad to notice. With regard to the present brochure we fully endorse what the Compiler says:—

It is believed that this will give the Tobacco grower many "suggestions" which may be of value in a practical way. Thus, there are described the various Plants, Soils and Manures, and how the successful Tobacco planter uses them in order to produce the very best, as well as largest crops, for quality in Tobacco culture is a more important item than quantity.

We notice that:—

At present, more than 7,000,000 acres of land are planted each year in this country (U.S.) with Tobacco. According to the Census report of 1890, the crop amounted to 488,255,896 pounds that year, valued at $34,444,499.

TROPICAL FRUIT IN NATAL.

AN INTERVIEW WITH A GROWER.

[*By "Ergates" in Durban "Agricultural Journal."*

From Pinetown to Durban the railway passenger sees on either side farm after farm of sub-tropical fruit. These farms are small, and possibly gardens might be a more appropriate word. The land is valuable, most of it within a mile of the railway stations being worth from £20 to £40 per acre. To get some information about this important district, I made inquiries as to a good authority and, by several who should be competent to judge, I was recommended to see Mr. Vincent Seymour, of Malvern. Mr Seymour wrote, saying he would be pleased to give me all the information I might ask for. Mr. Seymour comes from a family of gardeners, one of his forbears having devised the plan in the middle of the eighteenth century of training fruit trees on walls, and still known under the name of "Seymour's System of Wall Training"; see "Louden's Encyclopaedia of Gardening." The land now occupied by Mr Vincent Seymour was purchased by his father, the late Mr George Seymour, in 1881.

"What are the fruits chiefly grown here?" I asked.

"Pines and bananas. The growing of these fruits is the most attractive to the Indian, and the Indian is a large cultivator in these parts. For the most part he is only a tenant; he pays £1 or so per acre per year, and tries to get the quickest return possible. It is only the white man who goes in for orchards, for the rearing of trees means capital lying dormant."

"One pound per acre rent is apparently tempting to landowners?"

"It is; but whether the policy is good I doubt. The Indian takes all he can out of the ground, growing all together at the same time bananas, beans, ground nuts, tobacco, round potatoes, mealies, and so on. Rest is never given to the soil, and nothing in the shape of manure is ever returned to the land. Having worn out one plot of ground, he moves on to pastures new, and continues his former programme. As a reviver for exhausted soils dhall is one of the most effective things that can be grown on the Coast lands. Some Indians are beginning to buy outright. 'Bombay' merchants advance them the money. A great many of the cottages dotted about belong to mechanics, and their owners often do a little bit of fruit cultivation.'

BANANAS.

"Bananas," said Mr Seymour, "require good soil; bush land, if gettable. In such soil they will last seven or eight years with help but in grass land they will be of no use in three years. In Durban County alone enough bananas are grown to supply all South Africa, but I doubt, if you wanted 50 cases delivered today, whether you could get them owing to the last three years of drought. As with others of our fruits, it is glut or nothing. What is wanted is cool storage at the moderate charges of other Colonies. We look to getting about 12s per case, for the fruit only; a packing case costs 3s, and a case signifies 800 of the fruit. When the Johannesburg market was closed by the 3d per lb prohibitive duty I was glad to get 4s, though the price was utterly unremunerative. On

good soil, such as I have, the banana requires manuring after the second or third year—stable manure or rough weeds. The manuring may be called mulching. Mulching, of course, means spreading the manure over the roots and surface of the stool of plants, but here, with the hot absorbing sun, the overspreading of soil on whatever is applied is necessary. Shelter from wind is most necessary for bananas, and for practically all Coast fruit. There cannot be too much of it, for the wind is our worst enemy. Every fruit-grower here should have high trees, say gums, growing as break-winds to the south and west of his farm. Orange trees are also good for shelter, and mealies help at a critical time. It is distressing for a grower to see all the beautiful leaves of his bananas torn into ribbons, as for the most part they are."

MANGOES AND PINEAPPLES.

"The most marketable mango is the 'Bombay.' It is very large and not at all stringy. For my own eating I prefer the common kind. This country, however, is barely tropical enough for the mango. A cold, wet spring is fatal to the blossom, and such springs are not infrequent. In favourable seasons, however, crops are very heavy."

"The 'Jamaica Queen' is the best pine. It does not top-sucker so much as the ordinary Natal kind. Pines, like potatoes, mealies, nuts, &c., require periodical changing. Pines should be top-dressed before fruiting. They require good land, and are benefitted by artificial manures—potash, preferably. Between the middle of October and the middle of December pines often fetch from 3s to 8s per dozen, for large, well-grown fruits, and afterwards they become a drug, and fetch barely as many pence. Jam-makers rarely offer more than a halfpenny per lb. for them, and, as they need only half a pound of sugar for the pound of fruit, the returns should be good at the price jam is sold. Messrs. Barker Bros., living near here, are generally recognised as the growers of the finest pines."

CITRUS FRUIT.

"For the white man, the owner of land, citrus cultivation, in my opinion, is the most desirable. When once an orchard of these trees has been established—about seven years is necessary—he is in a good position. The profits are good, and the annual outlay in labour becomes comparatively small. Which of the varieties is best to plant? I unhesitatingly reply the naartje—a Dutch name. It is really the mandarin orange, or perhaps more correctly the China orange, although originally it came from Assam, India. We are much in want on the Coast of a Fruit Growers' Society, to attend, among other things, to the nomenclature of our fruit. For instance, the Cayenne pineapple is popularly called the Queen, and Isabel grapes are called Catawbas, and so on. The common orange does not pay well, only 1s 6d to 2s per hundred, on the average. The naartje, on the other hand, fetches 2s to 5s per 100; it is less bulky, and travels well. Naartjes require plenty of attention. Half-a-dozen different blights.—mussel, green and round scales, American blight, &c. attack the trees from the earliest stage upwards, and the paraffin emulsion sprayer is in almost constant employment. Grasshopper 'soldiers,' who strip off the young bark, are also at times a great nuisance. I always plant from seed, and in tins, choosing only seed from the largest and finest quality fruits. Some prefer grafting on to lemon stocks. I think the fruit is not so good, although I know many will disagree with me on that point, and the gain in time, if the growing of the stocks is taken into consideration, is practically nothing. Naartjes should be transplanted in the second and third year. They require good soil. Where my soil is too light, I put on ant-heap. All along the Coast we have ant-heaps ten feet high, and more in diameter. The soil of which they are composed is of the most tenacious character, and is just the thing wanted for sandy lands. Our soil is in great need of lime, and I hope, when the Port Shepstone railway is opened, that we shall be able to get it at a moderate price. I give my trees bone dust. In setting out naartjes, I always plant just a trifle above the general surface. No earth should be thrown up against the stems, or canker will follow. In manuring it should always be borne in mind that the side roots extend for a long way from the stem, and that they are never deeper than twelve inches from the surface. Proper pruning is most essential. At 18 or 20 in. from the ground let the tree branch out. I can show you an object lesson in this matter. One tree, which I pruned up to 2ft 6in, is as miserable a specimen as can well be conceived, and the next, with a short stem, where the soil and other conditions are identical, is about as fine a specimen as a grower can wish to see. The wood is hard, and the outer bark is closely attached to the wood, and will not stand the direct rays of the sun, especially when the thermometer registers—as it does sometimes—90 to 95 in the shade. The fruit should be all off by the middle of September. The 'Spanish Lemon' is also a good citrus for planting. The demand locally is small, but in England they would sell well. Some years ago I sent a small lot to Messrs. Wm. Draper & Sons, of Convent Garden, one of the leading fruit-broking firms in London, and the lemons were valued at 12s per 100 there in October or November.—*Natal Mercury*, April 15.

AN ISLAND ROMANCE.

THE STORY OF CHRISTMAS ISLAND.

During the century which has just passed, the stream of population has practically completed the circle of the globe, yet it was only in its closing years that a tiny little colony was founded on an islet in the Indian Ocean, whose history to future generations promises to read as thrillingly as a tale from the Arabian Nights.

Far away in the Southern Seas, some 200 miles from the cost of the ancient "land of gold," and almost 1,000 miles from the sunny country of the Golden Fleece, there may be descried this little speck of land jutting heavenwards like an emerald cone. Scientists regard it as an upraised coral atol, and take a peculiar interest in it from the fact that until the past few years it was the only known tropical island of any large extent which has never been inhabited by a savage or a civilised race. It is called Christmas Island. Why, no man living can tell. As to the date of its first discovery, the past is equally oblivious; yet it has been an object of spasmodic attention on the part of voyagers on the high seas for at least two and a-half centuries.

In 1666 the wandering Dampier of Holland sighted this small woody island, and since that date it has appeared in Dutch maps, but it was not until 1886 that a British surveying vessel succeeded in finding an anchorage and in landing and partially exploring the island. The following year H M S "Egeria" made further explorations, and the conclusion of the commander, in the light of what has since happened, is interesting:—'Man has never lived on Christmas Island, nor would it be a pleasant residence, as, apart from the fact that there is no water—the rains sinking into the limestone rock—the extreme discomfort of locomotion, and the absence of any harbour, whence the product could be conveniently shipped, will deter any settler from seeking a home there until other more favourable spots are occupied.' Within ten years or so after this prophecy, the island has a population living and thriving on it of some 600 souls, and from the phosphate deposits found

on it a Pactolean stream of gold is flowing into the pockets of British shippers, commission agents, agriculturists, insurance agents, and stockholders of the company working it.

EARLY DEVELOPMENT.

The story of the island—which is situated in S. lat. 10 deg. 35 min. E long. 105 deg. 42 min.—is romantic and of more than passing interest. Its discovery in the commercial sense dates from the days of the 'Challenger' expedition. That expedition cost this country £300,000, and there have been many who have carped at the expenditure of so large a sum for results which apparently were of little value in an ordinary utilitarian sense.

The expedition has, however, been the indirect means of adding Christmas Island to the British Crown, and in years to come Singapore, and the mother country also, are likely to receive from it alone much more than the cost of the Expedition, the leading scientific member of which was convinced, in face of the eminent geographer's report quoted above, that there was value scientifically and also commercially in the island. His researches among the deep-sea deposits in the vicinity of the island led him to this conclusion, and, in order to secure protection in developing it, he pressed the Government in 1887 to take over the island, obtaining the assistance of the late Duke of Argyll, and Christmas Island was formally annexed by the British Government in the following year, a lease extending over a hundred years being granted to this scientist and Mr Clunies Ross of the Cocos-Keeling Island, jointly, at a yearly rental of £150.

The prospecting of the island covered fully a decade, and finally a small private Company, composed of a few men eminent in the worlds of science, chemistry and engineering, was formed. This Company, as if by a magician's touch, has transformed what was previously only a haunt of bats and rats and a resting-place for sea-birds into a basis for the output of one of the most valuable fertilisers known to modern agriculturists. Within a single year after the commencement of operations, the hidden wealth of the island has begun to teem from it, and quarters of the world as distant as England and Germany and Australia and Japan are absorbing its manurial treasure and calling out for increased supplies.

FULL OF PHOSPHATES.

To return to the island. This up-raised top of a submarine mountain, round which seas run down almost perpendicularly from its shores to a depth of three English miles, is but ten miles long and seven broad with an area of 46 to 50 square miles. As already indicated, it rises out of waters deeper than those which surround any other tropical island.

Moreover, from a scientific point of view, it is the most interesting island on the face of the earth. When the pioneer inhabitant pitched his tent on the virgin shoreland of the isle, he could only discover two species of bats, two species of rats, and a shrewmouse. These were the only mammals. Down to the very water's edge the surface of the islands is covered with vegetation. Slopes, clad with trees, 'tall as Norwegian pines,' through which nothing is visible but glints of the sky, lead to a great central plateau, some 800 to 900 feet above the sea level, and the highest peak in the island, called Murray Point, is 1,100 feet above the level of the Indian Ocean. The plateau is covered with excellent soil, so rich that all tropical fruits and plants grow luxuriantly, and a special form of sago may yet find its way to the markets of the world from Christmas Island.

The plateau is one long succession of blocks of phosphate varying in depth down to 40 feet. At present these blocks are picked up from the roots of the trees and exported They are white almost as snow, and full of pure phosphate of lime to the extent of 85 per cent. Great difficulties were for a time encountered in obtaining an anchorage, and as many as ten barges have been lost, but these difficulties have now been overcome in Flying Fish Bay, and on shore a line of railway, two miles in length, carries the phosphate to the point of embarkation. During last year 30,000 tons of phosphate were exported, giving a profit of 75 per cent on the capital; within a year, it is confidently hoped, the output will rise to at least 100,000 tons. Even then the wealth of phosphate will only be tapped, and the supply at a much greater rate of output will easily outlast the term of the lease.—*Singapore Free Press*, May 7.

GERMAN PUBLICATION ON TEA PLANTING.*—We have to thank Mr. J H Renton, our tea commissioner, for a copy of a supplement to the "Tropenpflanzer" the organ of the Colonial Husbandry Committee, forming the May number of this periodical. It is a pamphlet of some 80 pages and gives the results of very recent research and work, whether of Mr. Kelway Bamber's or the writer's own analytical and chemical work. But it also explains very fully the processes of planting and tea-making, goes into the soils and climate required for profitable planting, the questions of labour and profits per acre. In fact we can imagine no more complete statement of the whole case in a nutshell than this *brochure*, and one well brought up to date. The pages upon fermentation and the relative values of first, second, third fourth and old leaves in the analysis are especially interesting; the writer also goes into the effects of light or heavy rolling and of various methods of withering which will all well repay a careful study by those who can manage the German.

RUBBER IN PERAK.—Mr. Derry, Superintendent of Government Plantations, has just published a very encouraging report which we shall reproduce in full in the *Tropical Agriculturist*. Moderately tapping 82 trees Para rubber, averaging 14 years in age, between March 1899 and July 1900, a harvesting of 327 lb. best quality and 33 lb. scrap rubber was got, and sold in London at 3s 10d for the former (pronounced equal to best Para), and 2s 6d for the latter. The net proceeds were £61 1s 6d which must be pronounced very handsome. Mr. Derry thinks that 200 trees to the acre at 6 or 7 years old might be able to give as good a return,—say, 2 lb. per tree, in place of the 4 lb. gathered from each 14-year old tree. But that has yet to be proved. Still the result is very encouraging to the planters of Para rubber in suitable soil and climate, and the margin of profit seems wide enough to cover all contingencies.—In the Kalutara district, we believe, 4 lb. per tree have been got from trees 10 years old.

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* Beihefte Zum Tropenpflanzer. No. 2. Mai, 1901, Berlin, N.W. Unter den Linden 40I.

TEA PLANTING IN INDIA AND CEYLON:

A TOTAL OF 927,000 ACRES (OF WHICH 132,000 YOUNG) TEA;

CHINA STILL THE LARGEST EXPORTER OF TEA;

LONDON OPINIONS OF TEA "PROSPECTS" AND "MANURING."

Against the 392,000 acres now under tea cultivation in Ceylon—with 30,000 acres not yet in bearing,—we may put the area of tea in all India at not less than 535,000 acres, of which as many as 100,000 acres have been planted from 1897 onwards and cannot therefore be considered to represent mature trees or fields in bearing. There is therefore altogether, 130,000 acres of young tea which must be taken into account, in order to emphasize the absolute necessity for both countries fighting for new markets in Russia and the Continent of Europe generally, as well as in America. The case stands thus for the British Tea-growing industry:—

Total.	Acres in bearing.	Young tea, acres.	Tea crop 1890—lb.	Estimate crop when all in bearing with fine plucking.
INDIA ..	435,000	100,000	187,500,000	220,000,000
CEYLON ..	360,000	32,000	148,400,000	160,000,000
Totals..	795,000	132,000	335,900,000	380,000,000

[India has had planted over 250,000 acres with tea since 1885, and the greatest areas by far in single years were in 1896—37,000 acres; and in 1897, over 36,000.]

Now, we do not think there is anything to frighten us in a total output—say three years hence—of 380,000,000 lb. of British-grown tea; and we are prepared to give good reasons for our hopefulness. In the first place, let it be remembered that China is still by for the largest exporter of tea. During 1899 she sent away altogether no less than 217,467,000 lb. of tea and for 1900 we do not think the figures can be less. This includes overland supplies to Russia in Asia (in fact Central Asia altogether) as well as to Russia in Europe. By sea China sent away 8 millions lb. more in 1900-01 than in 1899-1900. This should make up for any shortage overland. In fact, China and Japan together still supply the world with no less than 270 to 280 million lb. of tea distributed to North America, Europe, Australasia, Central Asia, &c. Now we see no good reason why British-grown tea should not by 1904, supersede the teas of China and Japan to the extent of 45 million lb. of tea, apart from the natural growth of the world's consumption of our staple. This presupposes of course, that the campaign on the Continent of Europe on behalf of both Ceylon and India will be carried on energetically for the next three years, and that the "sinews of war" will be supplied by an Indian, as well as by a Ceylon, Tea Cess.

It may be of interest to learn that Travancore (and Cochin) in all its divisions has now about 27,000 acres under tea of which 11,000 (together with 1,700 acres of coffee, 660 cinchona and 300 cardamoms) are reported for Sir John Muir's Kanan Devan and Anglo-America Companies in North Travancore—all being of course, comparatively recent plantings.

WHY RUBBER PERISHES.

The latex of plants may be compared with the milk of animals; it consists of a number of oil globules held in suspension in the form of an emulsion. In the case of rubber this oil is chemically a terpene $C_{10}H_{16}$, which by oxidation becomes an oxidised terpene or resin. Hence they could understand why it was rubber eventually was said to "perish." The juice became oxidised to such an extent that resin was formed, and the mass becomes brittle. Mr. T DAVIS, Chemist.
—*British and Colonial Druggist.*

RUBBER IN MEXICO.

There are wild and cultivated rubber trees, now growing on the Isthmus, sufficient to make the country rich, without regard to any other product. Mexican rubber is now worth 80 cts, per lb. gold. A good, healthy, rubber tree will produce from two to four lb. of rubber annually at from eight to twelve years old, A rubber forest of 1000 acres, containing 250 trees per acre, would yield at least $1 per tree profit, or $250,000 annually. The Isthmus is the only natural rubber producing country within the limits of civilization. The demand for rubber is increasing at a rapid rate, and those who are now growing rubber forests confidently expect to see Mexican rubber sell for $1 per lb. before their trees are in bearing. Those who have invested in rubber on the Isthmus will be well rewarded for their patient waiting.—*Home paper.*

BEE-KEEPING IN CEYLON.—Although greater interest is being shown in this pleasant and useful calling than, say, ten years ago, we are afraid as much attention is not paid to the domestication of the honey-bee by residents up-country and in the plains as might be done with profit. We fancy it is the sting of the bee, more than aught else, that deters people from experimenting as apiarists; but with experience there is really little to fear. Anyway, it is of interest to read that "Mr. W K Morrison, the bee expert attached to the Imperial Department of the West Indies, has recently discovered several colonies of stingless bees in the island of Montserrat. He is now trying what can be done by the use of modern hives to improve their honey-producing capabilities. Modern apiarists are of opinion that they can make the honey-bee conform to almost any conditions, so that Mr. Morrison's experiments will be watched with some interest. The honey of the stingless bee is clearer and thinner than that of ordinary commerce." In certain years there has been a considerable export of both honey and bees-wax from Ceylon to India; but usually, there is a steady import of the former for local use and this ought certainly to be saved by local production.

THE RUBBER PLANTING COMPANIES.

[Plantation; 'BuenaVista,' canton of Acayucan, state of Vera Cruz, Mexico.] " While we now have upwards of 500,000 rubber trees, ranging from young trees to 4½ years of age, the best showing on the isthmus [of Tehuantepec] is undoubtedly made by one of our neighbors, B Griffin, who has fully 30,000 rubber trees with his coffee, of 3½ and 4½ years of age, closely followed by J C Harvey, another neighbouring planter, who has occasionally written you articles on the subject." Rubber is planted 800 to the acre, with the idea of thinning out, by excessive tapping of some trees, when old enough to become overcrowded. Harvesting of sugar, tobacco, coffee, ginger, and corn has begun, and the first shipment of coffee was expected soon at Chicago. The Company favor rubber shade for coffee. Cultivated trees are reported to be shorter but of larger diameter than wild trees of the same age, and to yield more rubber. [Plantation " San Luis," near Palenque, department of Palenque, state of Chiapas, Mexico.] The Company own a tract of 24,700 acres, watered by the river Michol which empties into the Tujila, and that in turn into the Usumacinte, which enters the gulf near Frontera. The estate is divided into three "fincas"—named "San Luis," "San Francisco," and "Los Angeles"—the development of each of which has been begun. Up to January between 900 and 1000 acres had been cleared, except that trees of eight or 10 inches diameter are allowed to stand. Planting was begun last year, resulting in about 60,000 trees now standing. In January there were 50,000 or more nursery trees, to be transplanted this spring, when they would be a year old. Preparations are under way for creating more nursery stock, in order to provide for planting each season as additional land is cleared. Trees are planted sixteen feet apart, each way, the ground being cleaned for a space 5 feet square for each tree. It is estimated that one clearing of these spaces per year will be sufficient until the rubber trees have become large enough to dominate all other growths. —*The India Rubber World*, April 1.

"BASIC SUPERPHOSPHATE":

MR. JOHN HUGHES' PATENT; AND THE MANURING OF TEA.

A planter, who has paid a good deal of attention to the subject of the proper manure for tea, thus deals with Mr. Hughes' pamphlet:—

"I have looked into Hughes' pamphlet on Basic Superphosphate. Unless it is relatively cheaper than Basic Slag, I doubt if there will be much sale for it in Ceylon. Phosphoric acid in my experience is an essential ingredient that tea draws upon only to a small extent. Many Ceylon soils have ample for all requirements, for apparently an indefinite period. Basic Slag, however, is largely used along with buried prunings and generally speaking is most effective applied in this way, more so than burnt] and slaked coral lime applied in the same way. The acids formed during decomposition appear to supply the necessary solvent, which in certain soils, if applied in the ordinary way, might be a-wanting. The cost per ton is not stated, which is rather an important omission, as there is no means of comparing the value. For instance concentrated superphosphate, and finely slaked coral lime, where lime was deficient, might be found a cheaper form of restoring the balance. Quick acting manures for annuals are economical and sound, but for tea the problem is more complicated. It is one, rather, of adjustment of the essential ingredients in available forms and in due proportions, over much longer periods. We have rough and ready ways of arriving at this, but are yet a long way, I fear, from having accurate and scientifically recorded facts that can aid us much. The complexity of the conditions which even vary from time to time, are great."

CINCHONA AND CARDAMOMS.

A planter on the Annamalai Hills, Coimbatore district, India, says that a large amount of Ledgeriana cinchona will be planted this year, the very free, deep soil, with its splendid drainage, appearing to suit to perfection. Some neighbours of his are giving Succirubra and Hybrid a trial, thinking that cinchonidine will pay. The planter in question, however, believes in good-class Ledgeriana, and, if it grows as well as it promises, he thinks there will be no difficulty on the part of the Indian planter holding his own against the Java average of 5¼ per cent. quinine sulphate, or even the Java Government average of 7·16 per cent. As regards cardamoms, about 1,000 acres have been opened up to date in the Coimbatore district, Mysore seed has been tried, but not always with success.

EAST INDIAN DRUGS.

At a recent drug-auction five bales of jambul-seeds from India were offered, but no bid was made for them. This drug is apparently produced by *Eugenia Jambolana*, a myrtaceous tree, usually of considerable size, found in India and Ceylon, and distributed throughout the Malay Archipelago to Australia. The cotyledons are thick and more or less united or distinct. The fruit is subacid and edible, and is improved under cultivation. Of late years the seeds have been recommended as a remedy in diabetes, and the dried seeds, in combination with those of *Mangifera indica*, are administered with good effect as a powder in cases of diarrhœa and dysentery; they are also stated to be employed as an antidote to nux-vomica poisoning, the dose being 160 gr. in the form of a powder. Dymock, in "Pharmacographia Indica," gives the information that a vinegar is prepared from the juice of the ripe fruit, which forms an agreeable stomachic and carminative, and is also used as a diuretic. The bark is astringent, and is employed either alone or in combination with other drugs in gargles and washes.

Another East Indian drug offered at the same auction was three bales of hydrocotyle herb (*Hydrocotyle asiatica*), which we briefly noted at the time. The plant is a prostrate herb found in tropical and sub-tropical regions, occurring in India to an altitude of 2,000 feet in the Himalayas, and distributed throughout the Peninsula to Ceylon. It was known to Sanskrit writers of very remote times, being regarded as alterative, tonic, and useful in diseases of the skin. Boileau made its uses known in 1852 in the treatment of leprosy, and later, in 1885, Hunter experimented with it in Madras for the same disease, with sufficiently satisfactory results to bring about its admission to the Indian Pharmacopœia. In preparing the plant for use the leaves are stripped from the petioles, and are air-dried in the shade and ground to a powder, as it appears that if dried in the sun or by artificial methods they lose

a great part of their medicinal properties, owing to volatilisation of the oil which is their active principle. Another representative of this genus—viz. *H. Centella*, a native South of Africa—has astringent properties, the roots and stems being employed by colonists in decoction against violent diarrhœa. It is also said to be of great service in the treatment of chronic dysentery.

WILD VANILLA.

In an interesting article in last March number of *Chambers's Journal*, Mr Rowland W Cater relates his experiences and adventures while gathering vanilla in Central America. The author, while staying at San Jose, casually fell in with a native trader, and together they undertook an expedition into the interior of Costa Rica with the object of collecting wild vanilla and other forest products. Port Limon was the starting place, whence train was taken to Jimenez, a small settlement on the branch-line to Carillo. Here the travellers alighted and struck into the bush, the passage through which was comparatively easy. On the second day out a wild vanilla vine was discovered, hanging from a huge *zapotillo* tree, from which twenty-two pods were obtained and by sunset that day the travellers had found nearly 250 pods, or about twelve pounds, and that within a distance of little more than sixty miles.

Mr Cater gives a description of the wild vanilla vine (*Vanilla sylvestris*), which he says often reaches over 30 ft. in height, and is usually about the thickness of one's little finger. The vine is round, knotted at intervals, and covered with dark-green spear-shaped leaves. It throws out a number of thin arms or aerial roots as it rises, which, attaching themselves to neighbouring trees, appear to derive therefrom such nutriment that the vines are little dependent on the soil. Occasionally the wild vines completely cover the branches of the tree, and, running from it into adjacent ones, they will hang in huge festoons and arches so thick that they seriously impede one's progress in the bush. The vines blossom profusely—usually in the spring—the strange and delicate flowers, with their long, straggling, and pale-yellow petals, springing from the angles where the leaves branch off. After a few days' existence the flowers wither and fall ; and as their chance of fertilisation through any of the outside agencies on which they depend is a brief one, and precarious at best, very few of them are succeeded by fruit. This takes the form of a large pod, and, although the pods attain their full growth within fifty days from the fall of the petals, they take fully seven months to ripen.

The pods vary from 5 to 12 inches in length, and are about an inch across. In shape they resemble a knife-sheath ; hence the word vanilla, which is a corruption of the Spanish word *vainilla*—a small scabbard. Each pod contains a quantity of small black granules, surrounded by a balsamic pulp whose peculiar combination of oil and acid is supposed to impart to the pods the delicious flavour and powerful aroma they possess. Altogether the travellers were in the bush eight days, and as provisions were giving out they hastened with their plunder to Tortugero, where Mr Cater sold his portion to his companion at the current price in the settlement, and, having paid his share of the expenses of the trip, he came out financially so far to the good that he was prepared there and then to set out on a similar expedition, had the opportunity offered. Mr Cater winds up with a detailed description of the systematic cultivation and curing of vanilla in Central America (*Vanilla planifolia*), about which so much has been written in recent years by consuls and others. It is a fact not generally known, however, that Mexico produces the finest vanilla in the world, and that practically the whole of it is consumed in the United States.—*Chemist and Druggist*, April 20.

TURKEY'S PEARL FISHERIES.

A strong German syndicate is negotiating with the Porte for a monopoly of the pearl fisheries along the Ottoman shores of the Red Sea and Persian Gulf, which are to be thoroughly developed by the most scientific methods. One-third of all pearls won will belong to the Porte.—Constantinople, May 8th.—*Daily Express.*

BANANAS RIPENED BY GAS.

The West Indian banana, possessing a tougher skin and "keeping" fully a week longer than its rivals, has speedily popularised itself among the London costers. Every fortnight ten railway trucks full are consigned by Messrs. Elder, Dempster at Bristol to one of their agents, who has been appointed a member of the Costers' Federation. The fruit is stored, quite green, in the head offices of the federation in London, and ripened by many gas jets. Here the costers select their own bunches, and are charged nothing for storage.—*Express*, May 9.

NORTH BORNEO.

The new Governor of North Borneo, Mr E W Birch, C M G, leaves London on 8th inst. for Singapore *en route* for his new post. He has had much experience in the Malay States of opening new territories in the tropics and is possessed of many qualities that admirably fit him for the duties he will shortly undertake in North Borneo.

Probably one of his first endeavours will be to devise means for increasing the population of the territory. North Borneo, like other districts of the vast island, is very sparsely populated. The all-important question in relation to enterprises almost invariably relates to labour, which is one of the crying wants of the country. Fears have also been expressed that the railway contractors for the Beaufort-Jesselton line may, to get their contracts through in time, raise the price of labour. It is not difficult to get up such rates by an abnormal and temporary demand but it is nearly impossible to get them back again to ordinary rates, unless an adequate supply is available. We believe that the new Governor is authorised to give assistance to the extent of $20 to $25 per man, which, though probably not sufficient to land a man in the country, goes a considerable way towards it. Free grants of land along the railway from Jesselton to Tenom, or in the vicinity of the line, will also be made. When the line is working through to Tenom one of the first matters, as a corollary to its construction, will be to provide that back country, of which such glowing accounts have been given, with a population. The numbers in that district and up the Tambunan Valley only total a very few thousands and will need largely supplementing. Chinese is the class to strike for, as they are enterprising, hardworking, thrifty, and immediately assist the revenue in various ways. If the development of North Borneo has not hitherto been as rapid as that achieved in the Malay States we must remember that it has not had such a fortune ready at hand as the tin deposits have supplied. But it possesses a soil and climate singularly blessed in many ways. Its land will produce most tropical products, whilst, like the Malay Peninsula, it is remarkably free from devastating storms and great natural disturbances. Capital would come easier if the great difficulties attaching to labour supply were not superadded to the other ordinary commercial or planting risks. —*London and China Express*, April 5.

TO ALL PARTS OF ASIA, AFRICA, AMERICA AND OCEANIA.

Seeds & Plants of Commercial Products.

Hevea Brasiliensis.—Orders being booked for the coming crop, August-September delivery 1901 : booking necessary before the end of April ; quantities of 100,000 and over at special low rates Plants available all the year round. 100,000 and over at special low rates. A leading Rubber planter in Sumatra, who purchased 50,000 seeds in 1899, and 100,000 in 1900, writes us, under date 15th November, 1900:—" I received your letter of 20th October, from which I learn that you added another case of 5,000 seeds to replace the loss, &c. I am satisfied hereby, and even after this adding I am satisfied by the whole delivery of this year."

Castilloa Elastica.—True superior variety cultivated in Mexico, seeds from specially reserved old untapped trees. Orders booked for August-September delivery, 1901, booking necessary before the end of March ; large quantities on special terms ; Plants in Wardian cases.

Manihot Glaziovii.—Seeds and Plants available all the year round, 100,000 and over at special low rates. A Mexican planter, in sending an order for this seed, wrote on the 22nd August, 1900:—" If they arrive fresh and germinate easily I may send you larger orders, as they are for high ground where the Castilloa does not thrive."

Kickxia Elastica.—(*Funtumia Elastica*).—Seeds and Plants, orders booked. (Lagos rubber.)

Ficus Elastica.—Seeds available in May-June ; booking necessary before the end of March ; also plants.

Urceola Esculenta and **U. Elastica.**—Same as above. (Burma rubber.)

Parameria Glandulifera.—Orders booked for seeds for January-February delivery ; also plants; immediate booking necessary. (A good rubber creeper of Malacca.)

Landolphia Kirkii.—Seeds in July-August, early booking necessary. Plants can be supplied all the year round. (A highly-recommended species.)

Chonemorpha Macrophylla.—Seeds and Plants ; orders booked. (A very valuable rubber-yielding creeper.)

Memus ops Globosa and **Payena Leerii.**—Seeds and plants in July-August, booking necessary before April.

Achras Sapota, Willughbeia Firma, W. Edulis and other **Rubber and Gutta Percha** yielding Trees and Creepers, Seeds and Plants.

Cinnamomum Zeylanicum (Cinnamon superior variety). New crop of seed in April to June, booking necessary before the end of February ; also plants.

Coffea Arabica, Liberian Hybrid and **Maragogipe Hybrid.**—New crop March-April ; immediate booking necessary.

Cinchona Ledgeriana.—Seeds now ready, also other varieties.

Seeds and Plants of Nutmeg, Clove, Sandalwood (white and red), Pepper, Cardamom, Vanilla, Cacao, Tea, Coca, Fibre, Medicinal and Fruit Trees, Shade and Timber Trees, Eucalyptus various varieties, also Palms, Bulbs, Orchids, &c.

Our enlarged Descriptive Price List of Tropical Seeds and Plants of Commercial Products of Foreign countries for 1901-1902, now being prepared, and will be ready in a few months.

" SOUTH AFRICA."—The great authority on South African affairs of 25th March, 1899, says:—" An interesting Catalogue reaches us from the East. It is issued by WILLIAM BROTHERS, Tropical Seed Merchants, of Henaratgoda, Ceylon, and schedules all the useful and beautiful plants which will thrive in tropical and semi-tropical regions. We fancy Messrs. Williams should do good business, for now that the great Powers have grabbed all the waste places of the earth, they must turn to and prove that they were worth the grabbing. We recommend the great Powers and Concessionaries under them to go to William Brothers."

Price List of Seeds and Plants for CEYLON use, post free, on application.

Our new Descriptive Price Lists of Seeds of Shade Trees for Coffee, Cacao, Tea, Cardamoms &c., Timber Trees, Trees for Avenues, Hedges, Wind and Shelter Belts, Ornamental Trees, Shrubs and Climbing Plants ; and Seeds and Plants of Palms, Calamus, Pandanus, Cycads, Tree and other Ferns, Crotons, Orchids, Bulbs, Dracænas, now being prepared, and will be ready shortly.

Special Arrangements made with foreign Governments, Botanical and Agricultural Departments, Planters and others for supplying seeds and plants of Commercial Products in large quantities.

Agents in London :—MESSRS. P. W. WOOLLEY & Co., 90, Lower Thames Street.

Agent in Colombo, Ceylon :—E. B. CREASY, Esq.

Telegraphic Address:
WILLIAM, VEYANGODA, CEYLON.
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J. P. WILLIAM & BROTHERS,
Tropical Seed Merchants,
HENARATGODA, CEYLON.

CASTILLOA RUBBER IN MATALE.

Major Gordon Reeves is good enough to answer our enquiry about this rubber as follows :—

"About Castilloa Rubber, this tree grows luxuriantly on suitable land, not only two miles from Matale, but on clearings opened ten miles to the North.

"Year-old plants are having a growth of 3 to 4 feet. Our experiment in tapping at Wiharegama gave us a yield of about 2 lb. per tree *good* rubber; valuation of which has already appeared, viz., 3s 6d per lb.

"This was tapping from October to June. Latex does not flow in dry weather. These trees are about 10 to 12 years old and girth about 36 to 42 inches at 4 feet from ground."

Well done! This beats the Straits—7s per tree in 9 months is exceedingly good. What now about seed?—which from 10-12 years old trees ought to be very valuable.

THE BAMBOO IN FLOWER.

Has anything, we wonder, corresponding to this been observed in Ceylon?—

"Mr. A. Smythies of the Forest Service writes to the *Indian Forester* on the extraordinary flowering of the bamboo in the Central Provinces of India: A somewhat remarkable event is taking place in the Chanda district of the Central Provinces, and that is the flowering, on a large scale of the ordinary bamboo. The area over which the flowering extends is estimated at 1,200 square miles, and in this area, although a few clumps here and there have escaped, the phenomenon is universal. But the extraordinary point about it is that clumps of all ages are flowering—not only mature clumps but quite slender seedlings of six or seven years' growth or even less. Last year the droughts affected the bamboos in the Dhaba Range of this district, and the bamboo flowered over a small area, and produced a kind of manna. Many thousands of people were kept alive for some weeks on the seed. This year the area is infinitely larger, and the whole population will, in course of time, flock to the forests to gather the seed. The consequences to the people in the vicinity of this flowering and subsequent death of the bamboo will be rather serious. It is probable that, in this district at least the bamboo does flower gregariously over fairly large areas, as three of the oldest inhabitants informed me that they had seen the bamboo flower twice."

PRODUCE, PLANTING AND COMMERCIAL NOTES.

Discussing the new season for China teas, "The Grocer" points out that "statistics, if they mean anything, are unfavourable. Taking the official figures for the first four months of the year only, we note that, while the importations of China tea into the United Kingdom were but 3,201,066 lb., against 4,376,970 lb. in 1900, the clearances for home use had shrunk to 3,970,377 lb., in contrast with 6,277,523 lb. in the same period last year; and the quantity exported diminished to 3,988,648 lb. instead of reaching 8,780,505 lb, as in the four months of 1900. In all these totals the comparison for the year 1901 is on the wrong side, and to this fact must be added another of equal significance, viz., that a stock of over 30,000 half-chests of old season's teas are lying unsold or unshipped at Foochow Foo, at a time when the port there ought to be clear of such goods and waiting to receive arrivals of the new crop directly they are sent up from the interior. One cause for the flat condition of the market for China tea is that the chief blenders mix them much less freely than they did a year or two ago. Then there was an appreciable difference in the prices between China tea on the one hand and both Indian and Ceylon growths on the other—which difference was entirely in favour of China. Now, however, market rates for Indian and Ceylon are as low as, if not lower than, those for China teas; and consequently the former kinds claim more attention from the putters-up of packet teas than the latter. As is well known, the big blenders, who once took the commoner class of China tea to increase the bulk of Indians and Ceylons, and so bring down the averages of value where quotations for a quick sale were thought to be too high, are now careful to keep strictly to British-grown sorts which are extremely cheap and much more suited to their purpose."—*H & C Mail*, May 17.

SISAL HEMP.

(*From a letter of Dr. Morris, C. M. G., Jan 1901.*)

As no doubt you are aware considerable sums have been lost in attempting to start a Sisal industry in the Bahamas, chiefly through want of knowledge of the requirements of the plant and the sudden rush of persons who took up perfectly useless land at ruinous prices, I have estimated that under favourable conditions the cost of cultivating and extracting the fibre should not exceed about £10 or £12 per ton. The market price, however, is very variable. It has been as low as about £13 per ton; on the other hand, it has, for one or two years continuously, been as high as £30 to £40 per ton, or even higher. The plant will undoubtedly grow in Trinidad and Tobago. There are already a large number of plants running wild in the latter Island. It is to be remembered that it is not a cultivation for small proprietors. It is carried on on very much the same lines as a cane cultivation. I estimate that it requires a capital of about £7,000 to £10,000 to start and maintain a plantation of, say, 1,000 acres in regular working. Anything less than the area above given would not keep the scutching machines in full working, and thus add to the cost of management and the up-keep of the plantations. As only about three per cent. of the weight of leaves is returned in fibre, there is a heavy cartage of leaves to the factory. On an estate turning out say 500 tons of fibre not less than about 15,000 tons of leaves have to be brought to the mill. This necessarily involves considerable expenditure in carts and stock, or in estate tramways. It is stated that in very rich soils the fibre is not so strong and abundant as in comparatively poor soils in dry climates. Again, in the Bahamas, it was found that absolutely barren land was quite useless and led to disappointment and loss. I would only add a word of caution that no one be advised to embark on the industry unless he has ample means and can afford to wait some years before the plantation begins to yield the first returns.—*Trinidad Bulletin.*

CEYLON HILLS TEA ESTATES COMPANY.—We regret to see that it should be deemed necessary to wind up this Tea Plantations Company, but apparently there is no alternative. The Company owns four plantations: Rowley in Balangoda, Agra-oya and Hardenhuish in Lower Dikoya, and Laxapanagala in Maskeliya—altogether about 1,314 acres of tea.

ECONOMIC GARDENS FOR INDIAN TEA DISTRICTS.

Although we have no wish to underestimate the value of the several botanical gardens scattered throughout India, they must be considered more in the light of public pleasure grounds and museums, of little use to the commercial world. One of the mistakes usually made is that of locating these places in the vicinity of the sudder station, in provinces where variations of soil and climate are as diversified as they are in Assam, the Dooars and Darjeeling districts, as results obtained in one case are apt to be regarded as infallible tests for the whole; thus many plants that would receive fair play in congenial situations receive condemnation, being considered of no account. We have an instance of this in

VANILLA,

which many planters, including a Kew gardener, have endeavoured to raise in the hot steamy plains. Had the habitat of the plant been taken into consideration and operations conducted in accordance with it adhered to, many places in Assam would now have been exporting the pods, or their essence, in considerable quantities; but those who have hitherto essayed this cultivation have, for convenience sake, attempted to do so at least 3,000 feet below the elevation, in similar latitudes, where it attains the requisite marketable qualifications. To ascertain the real value of the products of a province it will, we believe, be conceded that the sites for these must be

SELECTED IN ACCORDANCE WITH THE HABITS OF THE PLANT,

instead of forcing, or attempting to, the latter to conform to unaccustomed conditions. Many plants have been sent down to Sibpur that no amount of skilful treatment has been able to induce to yield the product they do in the localities whence they are obtained; Chalmugr is one. *Ficus elastica* grows luxuriantly enough in Government House compound, the Eden Gardens, and many private grounds, but no one in his senses would endeavour to argue from this that a rubber plantation would prove remunerative in Lower Bengal. It is therefore incumbent that each of the plantations many people are suggesting should be stocked with such plants as are indigenous to the elevation, aspect, and climate.

TO RENDER THE PROPOSED ECONOMIC GARDENS COMMERCIALLY VALUABLE

there must be a series of them, and as Assam, more especially, possesses the prototypes of most plants known in the commercial world, besides, as has been recently pointed out, enjoying a perfect epitome of climates, there should be no difficulty in choosing eligible sites for each; but, if it is sought to clump all together in one spot for the convenience of forest or district officers' inspection, we have no hesitation in prophesying that two-thirds of the experiment will turn out abortive.

What is more essentially required to make the proposed plantations of real benefit, productive of revenue alike to Government and profit to the cultivator, is a close study of all the bountiful vegetable wealth of the provinces, for though both the Dooars and Darjeeling districts have been in the past most ruthlessly ransacked and exploited, there still remains sufficient relics to show what they once produced and so indicate suitable localities for propagation. Assam has not been so much denuded, so there is no difficulty there. It is not enough to argue that, because oranges, pineapples and other fruits are found growing from the plains up as high as 2,000 feet and more, a plantation of them will thrive equally well anywhere between these elevations; but we must ascertain at what height the best are produced, selecting the proper zones accordingly. No great expense need be incurred, as there are tea plantations already at various elevations on which a few acres could be set apart for experiments. Just

AT PRESENT THERE IS A RUSH FOR FIBRES,

the quotations for the most valuable have been lately given, and there is an enquiry for Manilla hemp, great doubts having been expressed as to the genuineness of the plants sent up to South Sylhet some years since, yet this plantain or something very closely allied to it, is, if we mistake not, to be found in the damp terai ravines under the northern hills from Mymensingh to the Jerii. Thus no great exercise of judgment is required in selecting fields for its cultivation. The best pines, either for fruit, or leaves from which latter the hill people's carrying bands are made, come from between 1,500 and 2,000 feet, which would also correspond to the height at which the Socotra aloe grows; sarsaparilla, ginger, turmeric, though generally considered the product of the plains, attain much greater perfection in the jhums at the same elevation, while salep, though inferior to the Afghan tuber, as also a course truffle, may be found among the roots of the stunted oak in the scattered woods from 4,000 feet upwards. To gather these in the hot plains or high up in cloud-land, and expect each and all to attain perfection under such conditions, is manifestly absurd.—*Indian Planters' Gazette*, May 25.

CONCERNING ELEPHANTS.

In the January Number of the *Indian Forester*, Long Tom sums up his curious article on "Cowardly Elephants" with the sweeping assertion that the elephant has always appeared to him to be "the slowest in thought of all animals that are trained by man, and to be absolutely lacking in reasoning power * * *." No doubt, a number of Forest Officers, who are friends of the patient beasts that do so much work for us, (and that I think with sufficient cleverness,) will come forward to prove, at length, that elephants are quite as sagacious and as capable of reasoning as, and even more so than, many domestic quadrupeds—like the horse—of whose intelligence we generally hold a high opinion.

Leaving such authorities on the subject to discuss the question to its right conclusion, I would like to just throw in a few observations of my own, in order to add weight to such arguments as may be forthcoming in favour of elephants and their decided ability to think. Perhaps Long Tom does not mean his article to be taken seriously, and, probably, wrote it to relieve his feelings after that old "female elephant" had smelt another dead green pigeon. But now that I have begun to write, I may as well go on for the sake of argument.

Firstly, it is beyond dispute that wild elephants show much cleverness, which is more of the nature of *thoughtfulness* than of common *instinct*. The way they collectively aid or defend their young; the practical manner in which they choose their feeding grounds and travel by well-selected permanent paths from one ground to another, just, as it seems, at the right time; the cunning manœuvres of the rogue, —all go to prove this. So do the incidents befalling at any Khedda.

Then, in the tame state, can any other animals be found that are able to remember and understand so many different words of command as our working elephants? Those who have seen elephants at work in timber yards, at any rate in Burma, will call to mind how cleverly they stack timber, although the methods of stacking may not be uniform. In rafting sunken timber, an elephant will readily, at command, hold a sinking log at the surface of the water until it is secured to some that are buoyant. In such cases, all that an elephant does cannot surely be put down to blind force of habit!

In the Andamans a few years ago, one of the forest tramways ended at a steep "shoot," leading down to a tidal creek that was used for floating out Padouk. The logs were large and far too heavy to be handled by men. So an old elephant, Bisheswar Prasad by name, was employed daily, when the timber was brought in from the fellings, in turning each log round on its truck until it was in line with the shoot, and then sending it off with a butt from behind. Often he did this without guidance from his mahout, and he would do it *accurately* every time. Another elephant sometimes helped to put up rough bridges, and would lift a beam to the required height, and *hold it there* until it was secured to the uprights. I do not say that this elephant knew that a bridge was being built so many feet above flood-level; but he appeared to understand that his mahout wanted the beam lifted up and held in place for a certain time, and he patiently listened to and carried out orders without a mistake. There is no need to quote more instances of this kind, although there is no end to the variety of them. These two alone, with what I have written above, seem to me sufficient grounds for concluding that elephants, either wild or tame, are by no means "*absolutely* lacking in reasoning power."

GYOK-BIN.

—*Indian Forester.*

COCONUT PLANTING IN THE TEA DISTRICTS AND INTERIOR GENERALLY.

An enquiry, as to the number of seed coconuts supplied from a well-known Veyangoda plantation to tea planters, has brought us the following interesting bit of information which we venture to quote:—

"I have sold about 80,000 seed nuts and plants during the last six years, of which about 32,000 went to the Kelani Valley. That ought to do, at 70 to the acre, for over 450 acres; but I believe, in order not to interfere with the Tea too soon, and not to shade the bushes out of flush, the plants have been put out 30 to 40 feet apart—say 50 to the acre; that would work out about 650 acres. I am surprised to hear that this estate had almost the sole honour of stocking the K.V. I thought resort was had to me after disappointment with purchases elsewhere. Any way, the progeny from here must cover a good part of the Island. Some nuts have, I think, gone as far as Anuradhapura; while the founder of the settlement got a contribution of seed nuts from me for Lemesuriagama! Then, next to the K.V., my largest customer was Pallegama which took over 20,000 seed nuts; but, from what I hear, very few plants have survived the drought, neglect, porcupines and thieves in that ill-fated venture. The other districts I have served are Kaduganawa, Peradeniya, Kandy, Matale, Gampola, Wattegama, Nawalapitiya, and even Ragama and Kalutara in the low country; while several thousand nuts sent to Mr. J— in the Kurunegala district means the faith of that veteran in change of seed, as he might have got any quantity of nuts in his own district."

Probably quite 1,000 acres of tea in the Kelani Valley have been covered by the 32,000 nuts interspersed.

1889 TO 1901: CHANGES IN CEYLON.

IN THE MOUTH OF THE KELANI VALLEY:

FIRST VISIT TO A PLUMBAGO MINE: KEGALLA AND WESTERN DOLOSBAGE.

(*By an Old Planting Correspondent.*)

We had made up our minds to visit the Tumbage plumbago mine, and our party should have been six at least, but at the last moment dwindled down to two. Leaving early in the afternoon, we reached the Kegalle and Yatiyantote road at the 56th mile-post, crossing the fording place in safety beside the old suspension bridge. There is a bazaar and many people both Sinhalese and Tamil hanging about here.

The cart road is a new one and the three bridges between the 56th and 54th mile-posts are well constructed, with well-built stone abutments. The scenery is wild and in places picturesque. At the first bridge there is a waterfall above and below the road; then we came to many zigzags which might have been avoided by taking longer sights and a little extra blasting. At present the zigzag at the foot of one of the tea estates is rather unsightly; however, the Government made it and it must therefore be right.

We had the pleasure of meeting Messrs. Daniell and Lewis, both recently returned from South Africa. The former gentleman succeeded Mr. Fraser of Waharaka, about 450 acres of tea. After resting for half-an-hour at the bungalow, we proceeded to Glenalla estate, one of the Gang Warily Group, making up about one thousand acres of tea of the Company with Havilland and Gang Warily itself.

Glenalla estate is a compact little place of 200 acres, awfully shut in by the hills around and sometimes very warm, about 92° in the shade. However, the tea looks well and so do the fruit trees and shrubs about the bungalow. Mr. Reeves is the present Superintendent. I doubt whether there is a thousand acres of tea requiring harder work than this group, in Ceylon. Dedugalla and St. Blane are very steep places; but not so large an area.

After early tea we started for the Tumbage Plumbago Mine and rode from the Glenalla Factory through the Bazaar and past some villages, arriving at the settlement of the Tumbage Plumbago Mine about 9-30 a.m. The ascent to the pits was something awful, a gradient of one in five or one in three or four, in places.

THE TUMBAGE PLUMBAGO MINES IN KEGALLE OR KELANI VALLEY.

It was difficult to walk up these short cuts on account of the plumbago spilt on the paths making it very slippery and, by the time we reached the pit's mouth, we were very much out of breath.

My companion, Mr. W., did not take long to decide about descending the first shaft

and your correspondent followed, holding on to the lining of the perpendicular wall with a coir rope stopped at intervals between the steps. It was quite an undertaking to climb down, but what about getting up again! I am glad the correspondent of the local "Times" was wrong in his statement that the shaft was two hundred feet deep. It was really only about fifty, but on reaching the bottom we had to creep along a serpentine tunnel for about one hundred feet, passing small galleries to the right and left, until we arrived at another shaft of fifty feet with two feet of water at the bottom of this pit. W. jumped into the bucket and the men lowered him down to the water up to his knees. One Sinhalese was working in the side gallery, using a jumper, and the vein or seam of plumbago, about four inches wide, was embedded in granite rock, requiring to be blasted out, when the plumbago would be reduced to chips and dust and require washing and picking over before being ready for despatch. My friend was well pleased with his adventure into the bottom of a plumbago mine and obtained a sample from the vein or seam, My sample of plumbago came from the heap; however, my sample is still firm and in one block, whereas my companion's lump went to bits in his coat pocket.

Now for the

TUG OF WAR:

climbing up the shaft into the open air again, we found youth won the prize and your correspondent made a bad third in the race; but being an old sailor, he would not be beaten and, though much out of breath, climbed the side of the shaft to the pit's mouth, puffing and blowing like a grampus. We were glad it was over and much pleased with the civility of the miners and the young Sinhalese guide sent with us by the clerk of Mr. Peris, the proprietor of the mine.

The clerk informed me that the mine had paid the three proprietors very well; that they employed 200 Sinhalese, and that the output was from 40 to 50 tons, monthly, valued, at one time, at seven-hundred rupees per ton. We understood him to tell us that the Tumbage plumbago mine had made as much as £100,000 (one-hundred thousand pounds) and, when we remarked that it was better than tea growing, he, the clerk, laughed long and loud and thought it a splendid joke. Since our conversation, some planters tell me that plumbago reached as high a figure as fifteen hundred rupees* a ton. The working expenses would be heavy as the work is very hard and disagreeable; skilled men are paid 1½ and 2 rupees a day and the foremen four and five rupees daily. We found men washing the plumbago and spreading it out to dry. Then it is removed to a shed where a number of boys and girls are employed picking it over and sorting it into three qualities. We were agreeably surprised to find the Sinhalese plumbago miners willing and obliging and not the scum of the population as often mentioned.

Our visit will, however, last us a long time for it requires "an effort" on the part of the visitor to understand the *modus operandi*, and he requires to be in "good form;" Many pits have been closed down through the fall in prices last year, yet as much as 7,981 tons were said to have been quarried in 1900 in the Kegalle district. There is another plumbago mine at the top of GLENALLA Estate, which is at present closed. It is called Knavesmire mine on KNAVESMIRE Tea Estate, also in the Kegalle district.

Our horses were very restive, waiting on the cart-road, and we had difficulty in holding them in returning to Glenalla bungalow to a late breakfast; however, it was part and parcel of the morning's adventures and a good shake up, though unpleasant at the time, may be beneficial afterwards. Anyhow, we had a good appetite for breakfast and did justice to a good curry.

The monsoon really seemed to have arrived on the afternoon of the 27th, and the wind and rain rushed through two gaps at once, making a great noise—yet this morning was as fine as the day before, and we enjoyed the ride back to HAVILLAND, the pony ridden being the third animal on this trip kindly lent to me by the planters on this side in Kegalle, Kelani Valley, and West Dolosbage. We must explore DOOLGALLA next journey.

H. COTTAM.

PEARLS AND PEARL SHELLS FROM WESTERN AUSTRALIA.

The following is a list of the principal Westralian exports for the last three years:—

Articles.	1898.	1899.	1900.
	£	£	£
*Pearls ...	20000	20000	20000
Pearlshell ...	78784	90647	86513
Sandalwood ...	31812	29719	39038

* Estimated.

Pearl Shell (decrease, £4,134).—This industry, as far as quantity of shell raised is concerned, has practically kept up to the excellent record of the previous year; but the value seems to have suffered a slight reduction. From returns published every year by this department, I have tabulated some figures which cover a period of eight years, and shed considerable light upon the state of the industry. These I now submit for your infomation, as follows:—1893, 523 tons; 1894, 441 tons; 1895, 350 tons; 1896, 361 tons; 1897, 366 tons; 1898, 619 tons; 1899, 783 tons; 1900, 737 tons.—*Perth Herald*, May 15.

RUBBER IN PERAK.—The following paragraph appears in Mr. Derry's Report:—

Central America Rubber "Castilloa elastica."—About 150 seedlings of "castilloa" from Ceylon seeds have been raised. It appears doubtful, however, whether the Ceylon trees are "Castilloa elastica" (true) or only an inferior variety, "Castilloa Markhamiana," the results of Ceylon trees being far below South Africa.

Mr. Derry must be referring to trees in our Botanic Gardens; for nothing can be better surely than the Wiharagama tapping of 10-12 year old trees, 9 months tapping giving 2 lb. of rubber worth 3s 6d per lb.

UNITED PLANTERS' ASSOCIATION, F. MALAY STATES.

(*Extracts from Report for 1900.*)

EXPERIMENTAL GARDENS.—Mr Stauley Arden has been sent out from Kew Gardens and, after a period spent in Ceylon, acquainting himself with the methods in vogue over there, visiting the various Malay States with their Botanical Gardens, and becoming kuown to the planters, has now been entrusted with the opening of an Experimental Garden. At the time of writing this report the locality is still under discussiou, though probably one of the blocks situated near Sungei Rengau will be the situation selected. The headquarters of the Manager, locality of the garden, products to be treated, &c, have all formed the subjects of correspondence between the Government and the Association.

PROPOSED LEGISLATION FOR DEALING WITH ABANDONED OR NEGLECTED COFFEE ESTATES—The Chairman informed the meeting that, after very careful consideration, the Committee had come to the conclusion that they were not in a position to recommend legislation, inasmuch as it was the experience of members that "shuck" estates were never attacked, but only fine coffee, the owners of which would take prompt measures to keep the pest within bounds, and that they therefore proposed with the sanction of the meeting to forward the following resolntion to the Government:—"That the Committee of the United Planters' Association do not feel disposed to take on themselves to recommend legislation on their own responsibility, but desire to express their great sense of the interest and assistance which the Government have shown in the matter, more particularly in connection with the remedial measures proposed by the Acting British Resident, Negri Sembilau." This resolution was eventually carried by 14 to 4.

EXPORT OF COFFEE TO EUROPE.—For some considerable time the question of finding a better market than Siugapore has been before the Planting Community; various solutions were suggested. A bonded warehouse where coffee could be stored to enable it to mature has been and is still under discussion. An assessment of all estates to enable the Association to advertise has also been proposed. During the past year, and very largely on the recommendation of Mr. T Haslop Hill, who has taken infinite pains in London to discuss the question, samples were sent home to Messrs. Sanderson & Co., of Mincing Lane. These samples were on the whole favourably reported upon, and the prices quoted were distinctly higher than those then obtainable in Siugapore. The Association, on receiving guarantees of over 100 cwt. a month from various members, decided to try the experiment of monthly shipments. A special Committee of Selangor and Negri Sembilan Planters was elected, but owing to various initial difficulties, the first shipment has only recently been forwarded, the result of the sale being still unknown. It may be of interest to the Association to learn that the small retail business initiated by one of the Selangor Estates, under the name of the Kajang Coffee Co., is progressing favourably and, though at one time it was thought possible that the venture would have to stop, recent reports go to show that the monthly output, though small, is an increasing, and to a small extent a paying, venture. We understand that a similar concern is working successfully in Edinburgh. The fact that at various Temperance Exhibitions the Kajang Company's stall has earned bronze and gold medals proves that, if properly treated, our Malay coffee finds favour.

An interesting experiment is also being tried. Some 12 pikuls of coffee have been bought from the Port Dickson Coffee Curing Mill by the Association, five pikuls of which have been sent to Aden and the remainder kept at Port Dickson, with the object of testing the system of storing coffee in a dry place before putting it on the market. Six months was the period decided upon and this has not yet elapsed.

[The Notes on "Planting Products" will be copied in full iuto our *Tropical Agriculturist*.—ED. *T.A.*]

SOME CONDITIONS OF COCOA: ATTENDANT ON THE GROWING OF SUCKERS.

The following is the paper on the above subject, read before the Uva Cocoa Committee on the 11th May, by Mr. L. Haweis:—

Mr. Chairman and Gentlemen.—There can be little doubt that, if canker had never made its appearance, the question of growing suckers on cocoa had never cropped up; therefore, at the outset, sucker-growing should be regarded as a method of defence against canker, and in no other light. Incident on the growing of suckers, however, it has been noticed how, generally speaking, the spread of a tree may be increased and its height curtailed, and, as this introduces quite another element into the question, the original motive for their cultivation is apt to be lost sight of, and even sacrificed to what at existing distances must be the very nncertain advantage of growing a broader tree. This advantage, or possibly disadvantage, I will not dwell on here; suffice it to say that sucker-growing for purposes of yield is contrary to all tenets of frnit-cnlture, and we have yet to learn that these do not apply to cocoa. I allude to the fact that fruit-trees bear best when kept to the primary branches; and if "spread" is the objective the means mnst be sought not in sucker-growing but in pruning

There is an idea that the less the knife is nsed npon cocoa the better. It is obvious that any excess of its nse must be deleterious but, to avoid excess, it is not necessary to go to the opposite extreme; that is no logical or sensible conclusion.

In the

WEST INDIES,

I believe, the cocoa tree, like fruit-trees al the world over, is snbject to a certain amonnl of pruning; and prnning, as pruniug, is not confined to what in relation to cocoa we call "suckers" and "gormandisers." The reason why the opinion is prevalent in Ceylon is owing probably to the fact that cocoa—Caraccas, at any rate—if carefully tended from its youth np, requires very little pruning of the larger branches and we have consequently been misled into the idea that the pruning of these larger branches is wholly nnnecessary. Further it is said that every cut in a cocoa-tree is a door for a parasite to enter, bnt this applies chiefly, I take it, to the older wood and, considering the small amonnt of prnning needed, it is not absolutely unpractical to snggest that all larger cuts be treated with tar or some other preservative less injurions to green wood. On the other hand the objection strikes me as being of academic interest in comparison with the immense good obtained by a judicious use of the knife; theoretically the door is open, practically it is comparatively rarely utilised, except possibly by white ants—(and white ants do not like tar, or a kerosine emulsion)—while borers of all sorts show no particnlar preference for a cnt surface, but prefer rather their own insidious method of the combined gimlet-and-corkscrew variety in greener and softer wood. But it is also a fact that very old wood is often actually softer than younger wood, and this may help to explain why such old wood does in many cases actually fall a prey to all sorts of insects—scavengers and others. This brings me round to my original point, for when the old wood arrives at the stage when on acconnt of its softness it attracts pests, it seems fairly reasonable to cut it out. And this wood it is which most planters will believe with me to be most subject to canker.

Canker having left its card in yellow leaves and impressed its seal of the familiar claret-hue, nature's first impulse is of reproduction. This effort may take the form of fruit or "suckers," or both. When the process of dying is rapid, the tree has time for no exhibition of this kind; but when it is long-drawn-out, fruit or suckers, or both, may appear, according to the virility and general condition of the tree. In the case of suckers, as in the case of fruit, they mature according to the extent they are unaffected. If affected badly the pods turn black, and the tips of the suckers droop and follow suit; but the suckers rarely die back in this way unless the process of dying is going on fast.

The process of dying, however, may be delayed and, under certain conditions, arrested by proper treatment, when the life of the suckers is saved, and we get new wood from the old root. It often happens, too, that the old tree recovers and, if not too many suckers are allowed from the base, continues to bear as formerly. But if the tree is aged, the old wood gets weaker and softer, the whole of its strength being absorbed by the suckers. When this is the case the old tree should be cut out to give the suckers every chance, and then?—then we have lost all crop from that tree for a year or eighteen months, until the suckers have matured.

This, I think, is a fair statement of facts, and this it is which has turned planters' attention to growing suckers, not merely on diseased trees, but on healthy trees also, in order to be prepared for a possible attack of canker.

Now, what is

THE EFFECT OF CANKER

in the old tree upon the suckers? It is clear that, if the suckers are to justify their existence, they must be kept from canker. A certain sacrifice of crop may have been, and is generally is, the immediate result of growing these suckers, therefore their well-being is of paramount importance; for should they become diseased we shall have lost both crop and suckers, and from every point of view this is disastrous. Then comes the fatal question, Can we cure the canker in the old tree? If we can, we must do so; if we cannot, the old tree must come away; for to keep tinkering at the tree while the canker is possibly spreading to the suckers is not to be recommended. The risk is too great, for once the suckers are gone our labour has been in vain. As scarcely the boldest, and youngest, planter would guarantee, I imagine, to "cure the canker," let us suppose the old tree is cut out. The immediate effect is probably diminution of crop, the ultimate effect the rotting away of the old stump. If the old stump rots away quickly, the suckers are again in jeopardy. Suckers, however, if close to the ground, or if the earth be heaped up around them, will throw down fresh roots, which very usually are not strong enough at first to bear their own weight. Sometimes, perhaps, in the majority of cases, nothing will induce them, short of props, to retain the perpendicular, and the weight of any pods they may bear generally brings them down in spite of the props which are seldom free from white ants. So, what are we to do? We cannot honestly trust 75 per cent. of these suckers, so that the need of putting in a supply becomes obvious. What is even more obvious is that the supply should have been there six years before.

The effect of canker on a medium-aged tree is not dissimilar but eminently more hopeful. There is little doubt that the best "bush-cocoa," that is to say, the bush the suckers may be trained into after the old tree is cut out, is grown from medium-aged trees. Their luxuriance of growth nearly always infects the old stump which is not so liable to decay, but they are by no means so apt to throw down roots of their own. The case appears to be one more of adaptation to circumstances than of independent action, and it is possible that, on this very account, perhaps, they are far more to be relied on than suckers from aged trees. A medium-aged tree, the provided that the main stem is cut in time, has a fair chance against canker, but the suckers rarely bear under the year.

It is a curious thing, and I wonder if others have noticed it, that suckers in bearing while the old tree is still alive, when it is cut out, do either one of two things, but rarely both; either they continue to bear putting on leaf very slowly, or they expend the increased energy they obtain from the large root, deprived of its main stem, in growing out into a fine spreading bush, the branches of which cease bearing altogether, save for a pod or two, until they are fully matured. This applies to suckers on old and medium-aged cocoa alike, and points to the fact that "bush-cocoa" can be grown only at a sacrifice of crop, illustrating the old and unexploded dictum that suckers on fruit trees are deleterious.

But a tree in bush form has the advantage, not of being any less subject to canker indeed, but of having several more stems than nature usually supplies; so that it is often possible to cut away half or three-quarters of the bush, and still have something to show in its place. That such bushes bear as well as the original tree may be doubted, but that they do bear at least fairly well is undisputed; and, possibly, under a modified system of culture, they may be almost as remunerative. At any rate, experiments are encouraging.

So that, as it is obvious that a young plant, in bearing, if possible, should be ready to take the place of an old cankered tree, it now occurs to me to ask whether it would not be desirable to be ready with a tree in bush form.

Now,

THE GROWING OF BUSH-COCOA

introduces variations on methods and results, with which we are not entirely familiar.

Anyone who has cocoa at 12 ft. by 12 ft.—and we all have—knows that well-grown Caraccas trees interlace at that distance; therefore, greater spread on our old fields we do not want. On the other hand, most of us are now replanting with Forastero, of altogether larger growth, and I am aware of an instance of a proprietor having planted Forastero at 18 ft., who complains of being laughed at. Some of you, gentlemen, at least will know of Forastero at 12 ft. and also that 15-year-old trees have an average perimeter of at least 20 feet; but I am not aware, except in one or two instances, of any practical conclusions having been drawn from that significant fact. On the contrary the "piling of Pelion on Ossa" is common, for on a certain such field I have in my mind the V. A. ordered suckers to be grown.

If, therefore, it proved advisable to start the cultivation of 'bush-cocoa' in good earnest, the usual distance of planting is manifestly inadequate for even Caraccas; how much more so, then, for Forastero.

And now I am going to be heterodox. Nothing is more noticeable in the story of Ceylon cocoa than the 'rule of thumb.' Cocoa in Ceylon was originally planted—I speak generally—without shade. Something occurred—probably helopeltis—to show that shade was beneficial. Everyone planted shade—even planters the condition of whose estates left nothing to be desired. I will not dwell on what distances that shade was planted at; everyone knows that; it was overdone. Then canker came; light was pronounced inimical to canker; the shade was cut out. Neither will I dwell on how that shade was cut out; everyone knows that that, too, in many cases was overdone. But canker has taught us something else: it has indicated that Forastero is the hardier (if less valuable) variety of the two; and, as Caraccas dies out, Forastero is now being almost universally substituted. And what I want to ask is whether this also does not threaten to be overdone. Unless Forastero is as remunerative as Caraccas, and as at present cultivated

it certainly is not, it is quite possible planters will regret the universal adoption of it. Incidentally, it occurs to me to ask what would a large majority of estates have done if, instead of Caraccas, there had originally been planted Forastero? There can be little doubt that the wonderful bearing qualities of Caraccas have done for cocoa in this canker crisis what Forastero, as known at present, can never do. There is, however, good reason to suppose that many varieties of Forastero hybrids, besides being hardier (a fact which has not been indisputably established) are quite as remunerative as Caraccas. But they have yet to be sorted out and this has not been done. Moreover their great irregularity of form largely augments the difficulty of their cultivation, and it is well-known that Forastero suckers act in a very different and far more irresponsible manner from Caraccas suckers. To grow a fine bush from a felled Forastero tree is infinitely more difficult than from a Caraccas tree, so that it almost seems that suckers, if grown at all, were better started during the new clearing stage, and it has yet to be proved that suckers on new clearings, however carefully tended, do not increase the non-bearing period a full year, or even two.

The question of growing suckers, then, is a much deeper one than on the surface appears. In the latest stage they are untrustworthy, and as canker generally attacks the oldest trees first and worst, it would be well if, at the age of, say, ten or twelve years, all fields were planted up again, especially as cocoa planting is not an expensive item, and this system would be an excellent preventive against at any rate the spreading of canker, for we could well afford to cut out the old trees for the sake of the new ones. But a tree at ten or twelve years of age is at its prime—just the time when the most successful bush may be grown; the growing of it into a bush at this age in the event of canker making its appearance does not, however, obviate the necessity of supplying up.

Remains, then, the question whether planters are willing to start suckers on new clearings. I confess to a great reluctance on this point, and, in view of what may be done in the way of planting up afresh and cutting out later, the matter scarcely seems worth as much consideration, except as a counter to canker, as whether Caraccas should not again be planted up rather than Forastero.

Gentlemen, it has been said, and said truly, that the wisest minds are open to doubt; and I would point out that there is even more doubt in the cultivation of Forastero than in that of Caraccas, about which latter we certainly ought to know more. Whatever advantage Forastero can legitimately claim at this present over Caraccas, it is almost entirely speculative; for not even greater immunity to canker has been proved. Yet I am willing to cede this point, considering all things, and in ceding it I will quote against it height, twice and three times the yield, plus as near total immunity from canker as may be obtained by cutting out at a suitable age in favour of a younger and more vigorous tree.

With regard, then, to what is going on around us, I mean the almost universal adoption of Forastero, I would ask you to decide, if possible, upon something definite. I would ask you to weigh carefully all the pros and cons, and to judge whether Caraccas has indeed merited the disgrace heaped upon it. It has done us more good than ill. Whether canker has come to stay or not, it will not do, however, to be unprepared for it; but neither is it advisable to deceive ourselves into thinking that sucker-growing on old trees is effectual counter-policy. I have tried to point out that as a makeshift it passes muster, but that it cannot obviate the necessity of eventual supplying up. And I know of too many instances to the contrary to be convinced that sucker-growing on new-clearings is satisfactory. There can be little doubt that they delay crop, and there can be no doubt at all that, should the tree be attacked by helopeltis, it suffers more through being killed back from six extremities than one. To carry the idea a little further is to introduce a possible absurdity, but it is worth noting that the abundance of extra flush may even be regarded as the finest attraction for helopeltis that human ingenuity could invent.

So that, except as a makeshift against canker, I have no good thing to say for sucker-cultivation—least of all for Forastero-suckers which, after abusing every confidence and baffling every hope, not seldom remain to delude the trustful superintendent into apologising for them in the name of experiment.

On the other hand, and in conclusion, I have heard it mooted (I believe in connection with Samoa) that suckers on new clearings actually induce the tree to bear earlier! I do not know what truth there is in this, but we do know it is contrary to all cocoa planters' experience in Ceylon, and I am inclined rather to be content with those ills we have, and to make the best of them, than fly to others we may end by regretting even more.

THE FUTURE OF "COFFEE"—was thus sketched by Messrs. I. A. Rucker and Bencraft (on May 16th). On July 9th, 1900, we wrote about as follows:—"The 1899-1900 Brazil crop at first was said to be probably the largest ever grown (1897-98 crop was 10,461,000 bags), and half way through it was still estimated at 9,750,000 to 10,000,000 bags. It turned out 8,971,000 bags, or at least 1,500,000 bags short of the original idea. On the same day we wrote that the general belief was that the 1900-1901 Brazil crop would be smaller than the 1899-1900 crop. Estimates varied from 7,250,000 to 9,000,000 bags, about the mean appearing a reasonable figure. The 1900-1901 crop is turning out at least 10,500,000 bags, or over 2,000,000 bags larger than the mean figure. If under ordinary circumstances estimates are fallacious, are they likely to be less so under the conditions now current? Bears argue :—(*a*) That the visible supply will be the largest ever known on August 1st, next, for that period of the year, and at least 1,000,000 bags heavier than that on August 1st, 1900. (*b*) That we shall then be facing a Brazil crop of 11,000,000 to 12,000,000 bags. (*c*) That the sterling value, say 30s for g.a. Santos, is 5s 6d above the lowest point some two years ago. (*d*) That the currency value in Santos is of no importance to the consumer, and that, even if it were, in the early eighties 3,000 reis were current against 4,000 reis now. As regards (*a*) let us assume that the visible supply on August 1st next is 1,500,000 bags instead of 1,000,000 bags larger than a year ago. The figures will then read :—

	1901	1900	1899
August 1st ...	430,000	340,000	399,000 tons

or an increase at the rate of 15,000 tons per annum since 1899, which is not very appalling, and hardly justifies all we hear about the enormous over-production. (*b*) Here Bears argue as if the crop were already harvested and secured; above, we have shown how erroneous estimates are. (*c*) The value of this statement of fact can only be gauged in conjunction with (*d*). We have seen it stated by a statistician that the equivalent, now, of 3,000 reis in the early eighties is near 5,000 reis, but, however that may be, 30s combined with 4,100 reis is a different tale to 24s 6d combined with 5,800 reis. The important point is, does 4,000 reis pay the planting community as a whole, or does it not? Time will determine these problems, and the position is undoubtedly one which may lead up to surprises."

THE CEYLON COMMISSIONER ON THE AMERICAN TEA MARKET.

The following letter has been addressed to Mr. E Tye, the secretary of the Indian Tea Association (London):—Dear Sir,—As requested by you, I send a short report on our tea business in America, as I found it during my recent visit there. Although the progress made in the introduction of Ceylon and Indian teas has been, I think, very considerable during the last seven years, it might have been very much more so, were it not for the many unforeseen obstacles we have encountered. Four years ago "standards" with a sieve-test were sprung upon us, in order that leading American houses might, by keeping out low grade teas, sell an immense quantity they had in hand. The success of this political move will be understood when I say that the value of their stocks rose from 4 cents per lb to 10 cents, as soon as the law was passed. Then followed the 10 cents duty, which has lowered the consumption of tea in the U.S. by ⅓rd lb per head, or nearly 25,000,000 per annum. Our teas are the only kinds which have not fallen away, but on the contrary have increased year by year. Last year the war in China threw an immense surplus supply of China Congous into the States. This tea cost an average of 10 to 11 cents in New York, but owing to quantity the price fell at once to 8 to 9 cents, and cheap as our blacks have been they could not compete. Houses already loaded with Congous could not purchase other black teas, however cheap. The imports to the States and Canada during eight years of Ceylon and India tea have been as follows:—1894, 4,723,000, 1895, 7,792,000; 1896, 9,474,000; 1897, 11,361,000; 1898, 13,608,000; 1899, 16,700,100; 1900, 16,130,000. This last year shows a slight falling off, but very slight indeed, considering the statistical position of China Congous. The fall has been entirely in Indians, Ceylon showing a good increase. Can this be due to India's withdrawal of funds? Ceylon: 1899, 8,298,000, 1900, 9,173,000. India: 1899, 8,487,000; 1900, 6,958,000. In the teeth of all those obstacles, and especially considering the enormous decline in the U. S. consumption of tea generally, I think the expenditure incurred by Ceylon and India in introducing their teas into America has been amply justified by results.

The imports of Congous last year were over 19,000,000 lb. against 11,300,000 lb. the previous year. These figures are the shipments from Shanghai and Foochow, and with, say, 16,000,000 lb from India and Ceylon, represent the consumption of black teas in the States and Canada.

Of green teas, and partly fermented Oolongs and Formosas, the imports are about as in this table:—

Green Japans	..	36,000,000 lb.
Green China	..	15,000,000 lb.
		51,000,000 lb.
Oolongs & Formosas		17,000,000 lb.

We have already got the market for 16,000,000 lb, out of an average consumption of about 28,000,000 lb of black teas. Not the taste of the consumer, but his indifference to quality of tea and the vested interests in the East of the old established importers prevent us from rapidly acquiring the greater part of the remaining 12,000,000 lb.

Now as to green teas and partly fermented teas, where the field is 68,000,000 lb. as against 28,000,000 lb. of blacks—here again I must warn planters against the assertions of disappointed editors.

To London alone more than this amount has come. There is one firm in Colombo that executes a contract with a Toronto house for 20,000 lb. of green tea per month. This same firm landed 1,000 chests in America last week, in execution of an order entirely independent of the above Toronto firm. If only 16,000 lb.. have been shipped, what has become of the 4 to 500,000lb. on which duty was paid during December and January, February and March? I think there are four firms doing extensive business with Canada who can account for most of it.

I notice those editorial attacks only to show how difficult it is in the face of them to induce those interested in it to continue patiently the manufacture of green tea, until it becomes a factor on the American market. The enemy is in our own household. But, notwithstanding, I am more confident today of the ultimate success of Ceylon and Indian greens than I have ever been. I have had numberless opinions of its quality and merits from dealers able to judge and, except the coarseness and ugliness of the pekoe souchong, made when coarse plucking was in vogue, I have had only one complaint viz., that—for Quebec Province—the liquor was too fine.

Of course there are very strong obstacles—the strongest being the vested interests in the East (China and Japan) of those who control the grocers, as brewers do "tied houses." These few firms are more united in opposing our greens than they were with the blacks, because their trade in greens is so much larger. A second obstacle is indifference. A Montreal gentleman, who has been pushing our greens, writing a fortnight ago, says: "It is not so much public indifference as it is trade indifference, because Japans have an established sale and for Ceylon greens missionary work is necessary. Then the wholesale trade are showing a much more interested front in keeping out the greens; their travellers poison the grocers' minds against giving our teas a chance. In dealing with the grocers we are not dealing with business men, but with mildewy fossils, who will not draw one tea against another. If they did they would be speedily convinced." Another writing me some months ago said he had bought a few hundred chests: "The liquor of Ceylon greens, in our opinion, is excellent, but the leaf of the Ceylons being so different will make them hard to introduce. Can you not imitate the dry leaf more closely? Try to please the eye as well as the palate. This is the time to push them; one dollar spent now is worth double or treble six months hence, when Japans may be cheaper, and the sentiment for British goods not so strong." True, but I can spend nothing while I get nothing; I can only include "green" with "black" in advertising.

A few small subsidies just now would greatly help to remove prejudice. I believe the difference in appearance of dry leaf is merely a matter of machinery. A roller need not necessarily twist. Another obstacle is the way business is done in America. When our teas are bought in Calcutta or Colombo they are consigned to an agent or broker, say, in Toronto. This agent *must* sell to a wholesale house, not to the grocer direct. Now, wholesalers in the States and in Canada (French and English) have told me repeatedly they

never handle a new article until the grower or manufacturer has made a market first. They will not do missionary work, their travellers object to it as, while they engaged in education, another firm's travellers sell the grocer what his customers have been accustomed to take. Travellers have to earn their wages, which depend on sales.

Now we had been making green teas in some quantity in Ceylon for six months before I reached Toronto in March. Nearly all these teas had been consigned to about six brokers in Toronto and Hamilton. I had been warning the Ceylon Committee almost every mail that their bounty and the very low prices for black teas would, combined, cause an accumulation in Toronto, as we had no money to help to make sales and overcome the obstacle of the wholesaler and his travellers. I found it so. True, some string packet tea firms were pushing the green teas, but they drew most of their supplies direct from Colombo. A few houses had bought some, which were chiefly used in packets. But the brokers were all loaded up, and had wired to stop shipments from Colombo. Things looked very blue, and the only encouraging features were that the packet people were hopeful, energetic, and full of praise of the quality, and that Japans were scarce and dear.

One importer suggested to me to get a number of ornamental canisters made, large enough to hold 50 or 60lb of tea, and offer one to each wholesaler for each 100lb of green he bought. This canister was to be given to any grocer who bought 100lb of green, and photos of the canisters to be given to the travellers to show the grocers. I had 1,000 canisters made, marked " Ceylon Green Teas" in large letters, and the accumulation of teas was swept off in a fortnight. I returned to New York, and when there I had letters from various Toronto brokers to the effect that they had sold their stocks and all afloat. One of them wrote: "I wired on March 10th to double my order, and on the 20th inst. to treble it." These canisters are standing advertisements for Ceylon greens in perhaps 1,000 shops. In Montreal no wholesaler would listen to me, as they are much more conservative there. But I hope to break through the ring there before the end of this month. I have been waiting for greens to arrive from Colombo, as there were none left in Canada. In New York I will only say that I was surprised by the favourable reception our greens were receiving about end of March, and I have had most encouraging news since I returned.

I could give many pages of quotations from letters from many sources, all of which are encouraging. But I must confine myself to a few. From New York, a fortnight ago: "The only thing we have to fear now is cheap inferior teas being sent from Colombo to cut prices, destroy profits, and disgust our friends." This is from a strong New York tea firm. From Buffalo: "Our trade in this city in blacks is 1,000 lb a week. With the same trouble we should do 5,000 in greens. In Utica and Syracuse 'green' is the great factor. See enclosed orders." He strongly recommends our doing something to attract attention during the Exhibition at Buffalo, but, unfortunately, there is no money. From Toronto: 'One of our travellers sent us nine orders this morning, six of which were for greens.' Another Toronto man writes: 'I am getting on well with the greens; had orders for 400 lb this morning.' Another grocery firm in the country beyond Toronto writes: 'We had 100 lb green Ceylon first week in January, 500 lb at end of January, 500 lb early in March. It is the finest tea we ever tasted, and we have yet to hear the first complaint about it.' These are samples of scores, all sent unsolicited. They may be deceiving me, but I think not. Many grocers have ordered them a second, third, fourth, and even fifth time, while, of course, others return theirs. It seems to me there are two ways of getting the teas introduced.

1. Make a large quantity and send it over to be sold for what it would fetch. If 2,000,000lb were made in India and dumped in America at 1d per lb loss it would cost India £8,000, which the industry could well afford. It would relieve the English market, and be an introduction to the American one.

2. That Companies should agree as to who should make the tea, that the makers should blend the standards in large lots and that instead of making a loss of 1d per lb as in the first method, the teas should be held for paying prices, the 1d per lb being used to grease the wheels of distribution, as I did with the canisters in Toronto.

There are many other important matters of which I do not care to write, but over which I would like a talk with you.—Yours truly,

W MACKENZIE.

P.S.—What is wanted is a regular supply of green teas for America. Spot teas can be sold, but orders for teas to be delivered four to six months hence cannot be obtained. At present it is the supply, not the demand, that fails us. Since I wrote the above letter I have had two instances of valuable progress with those green Ceylons. A New York firm bought 25 chests six weeks ago, the first they had handled. Within a month they had opened up 90 accounts with grocers who had not handled any Ceylon green before, and they had increased their purchases from 25 to 300 chests. Another firm in New York bought 25 chests three weeks ago—their first order. I have just learnt by wire they have bought another 150 chests.—*H C Mail*, May 17.

RUBBER CULTIVATION IN BURMA.

(*House of Commons*, May 18.)

In reply to Mr. Sharpe (Kensington, N.),

Lord G. Hamilton (Middlesex, Ealing) said :—The Government of India have recently authorised an extensive experimental plantation of the Para rubber tree in the Tenasserim Division of Burma, where the climate and other conditions are believed to be favourable. I am aware that attempts are being made to develop the production of rubber in Ceylon and elsewhere by private enterprise, but I do not think that this is a reason why the Government of India should not do their best to develop their resources in that country and encourage private enterprise by showing that this tree can be profitably cultivated in parts of India. —London *Times*..

PRUNE COFFEE and prune rum furnish a couple of channels for the relief of the terribly burdened prune market. The prune coffee contains 70 per cent. of the fruit, the remainder being cereals, and will soon be placed on the market in neat cartons. The distillers, however, are likely to get the larger part of the surplus of prunes.—*Merchants' Review*.

CEYLON *Vs.* INDIA IN THE TEA CONTEST.

We are favoured with the following remarks by an observant planting correspondent:—

"In the race for the survival we have this pull over India: owing to their short season and longer transport, I assume that most of their estates have to be financed in advance for the cost of production, whereas we can to a greater extent live from hand to mouth; but I am afraid the weaker in both cases will go to the wall. Gow, Wilson in their circular of the 10th show an annual increase in consumption, varying from nine to 26 millions Ceylon is not likely to exceed last year's exports; what is India going to do? Some of the Indian growers must have made serious losses in 1900. You published some months ago the profits per acre for the leading Indian Companies for 1899: these, with one or two exceptions, were shown at less than 30s per acre, say equal to 1d a lb. on a yield of 360 lb., less if the average yield was larger. Since then Indian teas for season 1900 dropped a 1d—where is the profit?"

There is much truth in what our correspondent says about "financing" and the advantage Ceylon has by its nine or ten months' plucking season. As for profits, we hear very little of such this year in connection with many Indian Companies. We notice that a Calcutta contemporary ("Indian Gardening and Planting") has been taking up the ridiculous view that, if India had gone in for extensive planting operations fifteen or twenty years ago, it could have closed Ceylon. The writer shows himself ignorant of the conditions prevailing in Ceylon, where 250,000 acres of land lying fallow (after the coffee collapse) did not require to be cleared, but were simply ready for planting at our planters' hands and the planting had to be done or the property thrown away. Moreover we do not see that Indian Tea planters have restrained themselves very much in their annual planting at any rate in recent years, when we find that since 1897, they have put in 100,000 acres of tea on new land, and in two years no less than 73,000, although in 1899 it came down to 19,000 and we suppose to less in 1900 with the shock which non-paying prices must have administered.

THE ST. PETERSBURG EXHIBITION.

INTERESTING INTERVIEW WITH THE IMPERIAL CONSULAR AGENT AT COLOMBO.

"We are officially authorised to state that the English exhibition which was to be held in St. Petersburg in November next, and about which full particulars have been published in the *Daily Mail*, has been postponed until March next. It has been found impossible to prepare the Tauride Palace, which the Czarina had promised to lend for the exhibition, by the date originally fixed. The decision is on many grounds to be regretted, although some of the Russian supporters of the scheme declare that March will be a better time for the exhibition to be held. Be this as it may, the novelty of an exhibition held at the height of the mid-winter season in St. Petersburg will be lost."

The above appears in the latest issue of the *Daily Mail* to hand by the last (French) mail and is dated May 18th.

We called this morning on Mr. Tchokoff, of the local Russian firm of Messrs. Stcherbatchoff, Tchokoff & Co.. and Imperial Consular Agent for Russia, to learn if he was able to give us any further particulars of the Exhibition,—to be represented at which we understand Ceylon is already making a move. At least, the official papers dealing with the subject have already been received by the local Chamber of Commerce and we understand that the Chairman of the Planters' Association has been asked to give the subject his early consideration.

"Mr. Bois was anxious to hear all we could tell them about the Exhibition," Mr. Tchokoff said, "but as nothing has appeared in the Russian newspapers or reached us officially from home as yet, we were unable to assist. But, as I have told Mr. Waldock, Ceylon should be well represented at St. Petersburg, for it must do it a great deal of good as regards the sale of tea in Russia. I was eleven years at St. Petersburg," said our informant, in response to a query, "and I know the Tauride Palace well. It is the largest palace in St. Petersburg"—and here followed a significant pause, for St. Petersburg as every one knows is a city of great buildings—"and could cover half Colombo!"—Mr. Tchokoff remarked, laughing, but adding: "No, not quite that, but most of the Fort, certainly."

"On what scale will the Exhibition be?"

"Well, of course, it will not be anything like as big as the Paris Exhibition. It is purely a British Exhibition, for which the Czarina lends her palace. But for Ceylon it is quite as important as the Paris Exhibition and perhaps even more important. There will, of course, be a number of visitors from all parts of Europe, but it is chiefly for the information of the Russian people that the Exhibition will be of use. There are quite enough people in Russia of the classes to be reached by Ceylon tea to make it worth while for Ceylon to be well represented at St. Petersburg."

SALE OF TEA AT THE EXHIBITION.

"Will the sale of Ceylon tea be permitted at the Exhibition?"

"Well, of that I am not sure. I have had no first-hand information on the subject. The papers which are in the hands of the Chamber of Commerce say that the sale of refreshments is not to be allowed; but this refers probably to intoxicating liquors and with due application from the Ceylon representative I have little doubt that not only will the sale of tea in packets be permitted, but a considerable business may be done in making known Ceylon tea to Russian visitors,

CEYLONS PREFERRED TO CHINAS IN RUSSIA.

Mr. Tchokoff, we should mention, has great belief in the future of Ceylon tea in Russia. It is not be, he thinks, a mere passing

boom of 2, 3 or 4 years; but the increase in the quantity taken from Ceylon is a true indication of a growing taste in Russia for our teas. Compared with China, too, Ceylon is well off—for recent telegraphic advices mention that out of the last offerings of China tea, usually sold in a day, not more than 3 breaks could be disposed of and that this took 3 days to effect! The fact is, Mr. Tchokoff thinks, that China has been attempting to compete with Ceylon in the matter of cheap teas and that in these it is unable to hold its own against our local product.

"Have you any information as to the expense of representation at St. Petersburg?" we asked.

"No, but if you apply at the Chamber of Commerce you should be able to see the papers with regard to the Exhibition, which have only just been received. I am to see Mr Bois on the subject very shortly. I have heard nothing about the date of the exhibition; which I do not think has been fixed, so that news of its postponement is a little premature." (Mr Tchokoff here referred to the *Daily Mail* announcement which we had already showed him.)

Thanking Mr Tchokoff for all he had told us, we next proceeded to the Chamber of Commerce; but first had a word with Mr Tokmakoff, of another Russian firm—Tokmakoff, Molotkoff & Co —whose early departure from Ceylon has just been announced. We asked if Mr Tokmakoff would be doing anything at St. Petersburg. "No: you see we can do all we want in the ordinary course of our present business, by sending samples through our Russian offices to our customers in Russia." Mr Tokmakoff was uncertain when he would be returning to Ceylon. He felt in need of a holiday, but did not know how much he might require.

AT THE CHAMBER OF COMMERCE

we learnt that Mr Renton had forwarded the papers dealing with the Exhibition and had offered to look after the installation of a Ceylon section at St. Petersburg, as he proposed in any case going to the Russian Capital in October to open a

CEYLON TEA ROOM AT ST. PETERSBURG.

The space in the Exhibition would be charged at 8s per square foot. Mr Renton's offer will doubtless receive early consideration, whether the Exhibition be postponed till next spring, or be opened in November, which is now reported to be impossible.

THE COMMITTEE AND PATRONESS

From the official papers, which are headed simply "British Exhibition in St. Petersburg, 1901-2," we found that the Exhibition (*confined solely to British producers and manufacturers*) is to be "held in the Tauride Palace and Grounds, St. Petersburg." Though these are "graciously lent for that purpose" by Her Imperial Majesty the Empress Alexandra Feodorovna, the Exhibition will be under the patronage of H.I.H. the Princess Eugenie of Oldenburg and administered by a distinguished Russian Committee of 18 persons; amongst them the most important are: —H.E. Count Lamsdorf, Foreign Minister; M de Staal, Russian Ambassador in London; the Rev. Alex. Francis, Pastor of the British-American Church at St. Petersburg, and M.A. Bilbasoff Secretary to the Russian Section at Glasgow The

COMMISSIONER FOR THE UNITED KINGDOM

is Mr George Collins Levey, C.M.G.; the Secretary. Mr. Edward Gorery, and there is a British Advisory Committee of 21 persons, chief of whom is Lord Avebury, President of the British Chambers of Commerce, and among whom we notice: Sir Jas. Fergusson, Sir Chas. Dilke, Mr. Geo. Wyndham, M. P., Sir Edward Sassoon, Sir H Seymour King, Sir Albert Rollitt, Sir Christopher Furness and Sir Jas. Linton.

The intention is to open the Exhibition on November 14th, 1901, and to continue it till February 14th, 1902. It is at this season of the year that Russian aristocracy, officials, army and navy, professional and mercantile classes, are resident in the capital, and Ceylon will thus have

A SPLENDID OPPORTUNITY

of bringing its products before the wealthy and intelligent classes of Russia. Part of the *raison dêtre* of the Exhibition is the decline between 1888 and 1899 of British trade with Russia: in exports from Russia 15 per cent (36·5 of the total, to 21·5), and in imports 4·1 per cent (25·9 to 21·8). In 1899

TEA

is the first of a list of articles showing increase as compared with 1898. Meanwhile Germany's trade had increased during the decade to 38·8 per cent of the total imports of Russia or 17·3 more than those from Great Britain. The national prosperity is at stake and it is pointed out that Russia's magnificent display at Glasgow betokens Russia's desire to extend her trade with the United Kingdom. There are no less than 31

RULES AND REGULATIONS FOR EXHIBITORS

which will doubtless be made fully known in due time. The most important are: (3) The Exhibition will be proclaimed a Bonded Store Warehouse; (4) space will be charged at 8s per square foot, arrangements for over 100 feet, or for special positions, being procurable. Minimum charge, £10; (15.) No articles of alimentation, refreshment, food, drink or tobacco shall be either sold or given away by any Exhibitor except by special arrangement with the Administration; (14) all goods to be in St. Petersburg not later than October 15th—penalty, forfeiture of both space and any money paid; (31) 25 per cent of the space money to be payable on application, the balance on allotment.

OTHER ARRANGEMENTS.

Juries of Russian and British subjects will award diplomas on the same principle as at Paris. The profits of the Exhibition will be devoted to the erection of improved dwelling-houses for the poorer classes of St. Petersburg on a site which has been granted by the Municipality. The Countess Elizabeth Schouvaloff, (who is on the Exhibition Committee) is president of the society devoted to the work. The Russian Committee will heat, light, and guard the buildings and grounds of the Tauride Palace and will make the necessary arrangements for music, publicity &c. It is intended that the Exhibition should be

OPEN AT NIGHT.

In conclusion, the following facts, indirectly affecting Ceylon (as a dependency of Britain and a colony trading with Russia) may be added. "The Russian Empire" covers one-half of Europe and one-third of Asia; contains every soil and climate, from arctic to sub-

tropical; possesses vast forests and tracts of arable and pastoral land, mines of every known metal, extensive vineyards and productive oil wells. The present population is 129, 211, 213, the foreign trade in 1899 was £1,399,000. But Russia, with resources developed, could easily support three times her present population and indefinitely extend her trade. In that trade Ceylon wishes to take a substantial share and towards attaining that object one step will be getting the best possible representation at the forthcoming British Exhibition in St. Petersburg.

CEYLON TEA COMPANIES' RESULTS.

The disastrous effects of over-production are very evident in the reports of the Ceylon Tea Companies, most of which, dealing with last year's results, are now to hand. Indeed, 1900 may be said to have marked the floodtide of over-production to date, and as the year advanced the effect on prices grew more and more serious, until in the autumn, and especially at the turn of the twelve months, the depreciation in values became very severe. The fall in prices more particularly affected the cheaper classes of tea, the highest grades, indeed, holding their own fairly well. In addition to the over-production evil, the trade was hampered by the increased duty of 2d per lb and by the heavy anticipatory clearances which were made both in respect of the 1900 and 1901 Budgets, so that the market during a twelvemonth or longer was kept more or less in a state of disorganisation, which interfered with a correct appreciation of the relations of supply and demand. As regards the Ceylon companies, the main point, however, which is brought out by an inspection of their reports is that the high-class producers and those which have taken care to fortify their position and maintain their finances on a sound basis have not suffered severely so far as their dividend distributions are concerned. A glance at the following list will substantiate this statement, the chief sufferers in these, as in other cases, being, as will be seen, the producers of lower-grade teas :—

Company.	Net Profit.		Appropriations for Reserve and Depreciation.		Dividend.	
	1899	1900	1899	1900	1899	1900
	£	£	£	£	pc	pc
Ceylon Tea Plantations	43,664	41,010	10,000	10,000	18*	15
Eastern Produce and Estates	..28,615	15,790	nil	nil	7	3½
Standard Tea	..10,780	12,148	1,700	2,800	15	15
Nuwara Eliya	..17,290	18,263	2,300	2,963	7	7
Scottish Ceylon	.. 6,960	5,318	1,400	638	12	10
Alliance	.. 7,900	4,660	1,000	1,000	8	7
Yatiyantota	..12,120	6,753	1,000	1,000	7	4

The first company in our table, the

CEYLON TEA PLANTATIONS,

shows only a slight diminution in net profits as against the preceding year, and it has been able to maintain its dividend at the usual rate of 15 per cent, although this time the 3 per cent. bonus which was distributed on account of 1899 is not forthcoming. The Company, however, appropriates £10,000 for depreciation, and as it possesses a reserve fund of £100,000, which is partly invested in coco-nut plantations, thus giving it a second string to its bow, it occupies a very strong position, and may be fairly expected to maintain its ground.

* Including bonus of three per cent.

The EASTERN PRODUCE AND ESTATES Company, which comes next on our table, makes, unfortunately, a very different showing. The Company grows only medium, and in some parts indifferent teas, and it is handicapped by being obliged to redeem every year £7,500 of Debentures until the latter have been reduced to £50,000, an event which should take place in 1905. The fall in the price of cheap teas has, naturally, affected this Company severely, compelling a reduction in the dividend from 7 to 3½ per cent. It may be mentioned that an interim distribution of 2½ per cent. was made in the autumn, so that the Company appears to have been exceptionally hard hit by the break in prices which took place at the end of the season. It is probable that, so long as the undertaking is saddled with the heavy annual charge for debenture redemption, it will have rather difficult times to contend against. A strong contrast to the Eastern Produce Estates, and one well calculated to illustrate the differences which exist in this class of company, is presented by the STANDARD Tea Company, which, in a confessedly bad year, actually exhibits an increase of profits. The explanation is that the Company is a producer of high-class teas, and that it possesses a new acreage now coming into the yielding stage—a rather rare circumstance of Ceylon. It is consequently able not only to maintain its dividend at 15 per cent, but to increase its appropriation to reserves and depreciation. A point in favour of this Company is its small capital, but the fact that the shares most freely dealt in are only partly paid, having a liability of £4, will operate as a deterrent to some people. The NUWARA ELIYA has also enjoyed a very successful year, its prosperity being due to practically the same causes as those which we have just examined in the case of the Standard. Its estates, which are situated in the Highlands of Ceylon, produce first-class teas, and it also possesses some acreage of young plants which have just reached the bearing stage. Its profits, as will be observed, show a fair advance over those of 1899, and it has not only succeeded in maintaining its dividend, but also in strengthening its financial position. The quality of this Company's teas and the excellence of its grounds will probably enable it to stand out from the ruck both in good times and bad. A more indifferent though by no means a bad showing is made by the SCOTTISH CEYLON. This Company possesses a good middle-class garden, somewhat on the same lines as that of the well-known Ceylon Tea Plantations, and it has achieved very similar results during the past year. Its profits have fallen below those of 1899 and it has in consequence to reduce its dividend by 2 per cent., but it still maintains its distribution at the previously usual rate of 10 per cent. It may be remarked here that the shares of this Company are well held and are rarely negotiated. A heavy fall in profits has marked the operations of the ALLIANCE, and although it still distributes 7 per cent. dividend, against 8 per cent for the previous year, it has been obliged to reduce its carry-forward by nearly £1,000. This Company is not particularly strong in the matter of reserves, and under the circumstances it might well have been a more

prudent policy to cut down the distribution for a time. Another Company whose profits have been heavily reduced is the YATIYANTOTA. This property produces large quantities of cheap tea at a very low cost, and it succeeded in doing so last year. The extremely low prices ruling, however, hit the Company hard and are responsible for the diminution of the dividend from 7 to 4 per cent. Nor at the present range of tea values can the shares of the Yatiyantota be considered very attractive. Still it is possible that the swing of the pendulum will bring about some slight improvement in the value of low-grade teas before the close of the year. As an illustration of the severity of the drop in prices, it may be mentioned that, while 18 months ago the average figure obtained for tea from these gardens was 6d and upwards per pound, the product only realised an average of 3½d to 4d per pound at the end of the year. We have not included the DIMBULA VALLEY in our list of Companies because the last report issued only covers nine months, the financial year being made up to the end of December instead of March as heretofore, in order to bring it into line with the other Companies. A dividend of 7½ per cent is distributed for the nine months, or at the rate of 10 per cent per annum, while £1,000 is placed to the reserve and £1,970 carried forward; the rate is the same as that for the previous financial year, so that in the conditions prevailing the Company must be considered as having done fairly well. In connection with theCompanies dealt with above, the report and table of prices, compiled by the Indian Tea Share Exchange and published in our today's issue, should be studied.

Writing on the Ceylon Tea Companies at this time last year, we referred to the cloud of over-production which still overhung the horizon. That cloud, as he have seen, has since burst with a vengeance and caused a great shrinkage in prices. We also remarked that large extensions of gardens were practically at a standstill, and that remark applies with even greater force today. It is doubtful, however, whether we have even yet quite got over the effects of the extensions of previous years, so that, unfortunately, the over-production bogey is not definitely laid. Efforts are certainly being made to bring about a reduction in output, either by finer plucking or by resting the less productive portions of gardens for a time, but we do not think that sufficient attention has yet been drawn to the necessity of checking the expansion of gardens, and we would urge everyone interested in the welfare of the industry, either as a shareholder or otherwise, to press home this point. In Ceylon the danger of over-expansion is mitigated by the comparatively poor character of the low-lying lands, some of which under cultivation are already rumoured to show signs of exhaustion. But in India there is room for unlimited expansion, and if everything else fails to check it we can but hope that the increasing difficulty of financing such propositions will have that effect. As regards the Ceylon Companies not included in our list, it must be confessed that the majority show poor results for 1900—in some cases exceedingly poor results—the extenuating circumstance being that the conditions were exceptionally unfavourable. With these concerns it is a question of the survival of the fittest, and the weeding out process will not be altogether disadvantageous to the stronger undertakings. With reference to present conditions, the Ceylon crop, now in full swing, shows a slight curtailment, while the latest news with regard to the coming Indian crop is to the effect that the drought has delayed the early pickings, so that it will probably be somewhat late on the market. That, however, is rather a favourable feature than otherwise, since it will allow of time to clear off accumulations but, as the Indian season is only just commencing, it is too early to speak with any certainty on the subject. —*Financial Times*, May 14.

FISH CULTURE IN INDIA.

The following information contained in the *Asian* will be read with interest by local fishermen :—

During a Municipal discussion upon the condition of the water in the Ootacamund lake, it incidentally transpired that the imported carp and tench had multiplied up to myriads, as one piscatorial euthusiast put it. Whether due to climatic or other causes it is certain that the success of fish acclimatisation on the summit of the blue mountains is assured, and it is to be hoped, therefore, that efforts at emulation will be made in all our hill stations and other places where lakes already exist or can be improvised by bunding or stream diversion. A good deal of attention has recently been directed to Assam. It may not be generally known that in the mountain range, dividing that province, there are numerous lakes and tanks where pisciculture or rather acclimatisation could be carried out. Now that District Officers, like Mr. Earle of Darjeeling, have been permitted to take these matters in hand, we would direct special attention to the very considerable expanse of water at Nurtiang, eleven miles north of Jawai, in the Jyntia hills, the large artificial tank four miles west of that sub-division; the Batao tank (should the bund have been repaired), and the reservoir erected by Mr. Inglis in the centre of the abandoned station of Cherrapunji for, though the latter place has been given up as a European haunt, it is becoming a large native town. The localities mentioned are within easy distance now of steamer or rail communication.

INDIAN PATENTS.

Applications for the under-specified inventions have been made.

No. 162.—Andrew Gilmour McMeekin, tea planter of the Allynugger Tea Estate, Shamshernugger, South Sylhet, British India. Improvements in tea firing machines.

No. 164.—The Right Honourable Douglas Mackinnon Baillie Hamilton Cochrane, Earl of Dundonald, of 34, Portman Square, in the county of London, England. An improvement in tea and coffee pots.

No. 179.—Frank Edmund Winsland, engineer, and George Ernest Moore, engineer, both of Joyhing Tea Estate, North Lakhimpur, Upper Assam. Improvements in apparatus suitable for packing tea.

No. 180.—M Judah, mica merchant, residing at No. 40, Radhabazar Street, Calcutta. Improvements in sun-proof mica hats.

No. 182.—James Begg, tea planter, of Hoolungorie Tea Estate, Assam. A new or improved machine for artificially withering tea leaf.—*Indian and Eastern Engineer*, May.

DOLOSBAGE IN 1889 AND 1901.

(By an old Planting Correspondent.)

DOLOSBAGE.—One of my old districts, with its Bible Rock and Sentry Box, are in sight and, with elevation, the mornings and evenings are much cooler and enjoyable.

DIFFERENT ESTATES—NOW AND THEN.

COOROONDOOWATTA was reached at midday and my old friend, A. J. S., gave me a hearty welcome, making me feel as much at home as he did down in the Fiji Islands.

We visited quite a new estate, called "Jak-Tree-Hill," next morning; in going there from Cooroondoowatta I had to retrace my steps towards Vellekande and descend a considerable distance into a deep valley, passing a few native tea gardens and Sinhalese villages—then the new bungalow appeared in sight and we made straight for it only to get a view of the country around, Mr Blackett being absent in England. Jak-Tree-Hill is not only a valuable tea estate of over 200 acres, but is quite a Botanical Garden with shade trees and palms in profusion. Near the tea factory we came on some mangosteen trees in blossom; they bore a few dozen last year; cacao was doing remarkably well under the shade of fruit trees.

The factory is new with all improved machinery and Mr. Stephens has adopted his method of continuous hessian tats for withering. The battens at the ends are about eight inches and the whole jute hessian must be stretched tight; this system is a good one, preventing much waste of jute hessian and extra carpenter's work at the stanchions. There is an oil-engine driving power here and everything goes on satisfactorily under the able supervision of Mr. A J Stephens.

COOROONDOOWATTA is well suited for a tea estate, being a gentle undulation and easy to dig and manure; the old terracing of the coffee thirty years ago, black with age, supports the tea round the edges of roads and on hill sides. Timber trees are plentiful, including mango, jak, breadfruit, wild artocarpus, sapu, grevilleas, acacias, papaw, plantains, and palm trees.

In the factory we find some 17 or 18 chulahs as well as a sirocco. The chulah-fired teas are of good flavour and preferred to machine-made teas. At the beginning of tea manufacture in India and Ceylon, many planters were of opinion that chulah firing was preferable to the sirocco and that the fumes of charcoal were directly beneficial to tea-making; what is the opinion you have formed on this subject? (I remember when in Assam, acting as your Special Correspondent, that very many, if not all, the planters of Assam used chulahs and charcoal fires. This was in 1876.)*The cultivated area of Cooroondoowatta is three hundred and seventy acres, all under tea. With other charges, Mr. Stephens is managing about seven hundred acres of tea. Forking has been done here to advantage and there is a good flush on the bushes at the present moment. Hapugahawatta is a good piece of tea, but not undulating like Cooroondoowatta; there is a drop down to the paddy fields below and an awful stiff climb up. However, A.J.S. looks in good condition, considering the amount of exercise he gets in a very steamy climate. It was *a nice little walk* up to Medegoda from Cooroondoowatta by short cuts, crossing a deep stream and climbing over slab rocks—my box cooly was a good fellow and helped me through all right. We had a coconut at a village and he got quite communicative; during the course of conversation in Tamil, Ramasamy expressed his views on the situation and the decline in the price of teas; he, Ramesamy, got a little mixed up about the war in South Africa and told me that so many gentlemen had been killed in the war that there was nobody left to drink tea and hence the sudden fall in prices; happy-go-lucky Ramasamy—his ideas of the outside world are very limited.

MEDEGODA is over 200 acres of tea. Coolies were clearing the drains and the estate looked well with some nutmeg trees in bearing and cacao thriving. We passed the bungalow and got into Wewekelle over the ridge. Wewekelle, the old place of Dr. Shipton, is now absorbed in the Tamaravelly group. We crossed the wide stream or river running below it and ascended Epplewatta on the other side. Old Stanmore Hill is forgotten in the Tamil name of Tamaravelly. By-the-by we noticed disease in the Lantana or wild Verbena; it is black with disease, a kind of blight. The planters must keep it clear of their boundaries or it will get into the tea. "Everybody" told me it did not hurt the tea, but unfortunately I found it very bad on some tea and hope it will not spread into tea as H.V. did into coffee. It would be good to cut it out and burn it in time. Lantana seeds very freely and spreads fast in chena lands and patana. There is not much in Dolosbage and it would not cost much to get rid of it at once.

PEN-Y-LAN or Balatakanda with over 500 acres of tea is still to the fore and possesses some old tea planted in the forties by Mr. Lewellyn; some of that tea still exists and measures two feet circumference of stem, and there is a bush measuring about thirty-six feet in circumference. Mr. W R Tringham has borne the heat and burden of the day in Ceylon, numbering his 35 years' experience in coffee, tea, and cinchona, and looks well and hearty. There is a good distance between the factory and the bungalow and the writer did not go down to the factory, but proceeded on to Kellie over the next gap, passing through some seed-bearing trees to the new bungalow. The Kellie group factory is a very large one with both water and steam power; the water-wheel is thirty feet in diameter or ninety in circumference; the steam engine works the balance of the machinery and the three rollers and sifting machines may be seen all working at the same time. There was difficulty in getting up the boiler and elephants had to be employed. The Superintendent has good reason to be proud of his factory, as also of a flat field of tea, giving thirteen hundred pounds of leaf per annum per acre.

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* Some of the London Brokers to this day regret the gradual disappearance of chulah-fired teas.—ED. *T.A.*

The cardamoms at Hormusjee are a great success and looking remarkably well, some seventy acres, thirty of which are in bearing, extending to the source of the Doteloya river; and cardamom cultivation continues on the Doteloya estate in the shade of forest in the deep gorge or valley of the Doteloya river. Hormusjee tea looks very well and we had pleasure in meeting one of the sons of an old Dolosbage planter. Thirty two years ago the son of Archdeacon Glenie was Superintendent of Barnagalla. Mrs. Glenie is now in Travancore with her son on a tea plantation.

DOTELOYA ESTATE or Nona Totum is now incorporated in the Tea Corporation, Limited. There are some 700 acres cultivated and 645 acres of tea. I believe there are 30 acres of cacao and 30 acres of cardamoms besides nutmegs, cinnamon, annatto and other products noticed near the bungalow. The writer obtained permission from the late Mr. Blackett to visit some cotton planted on the site of Jak-tree Hill. Mr. B., senior, was quite a pioneer in new products and was a very successful planter. Doteloya tea looks well as does all tea in Dolosbage; the district compares favourably with other districts according to the opinion of experts. We met the Superintendent on the road and continued through the jungle with the intention of hunting up another old landmark of Dolosbage, one of the pioneers of tea and cacao planting in the district, Mr. JohnDrummond. The weather has been severe in this quarter and we got a very good ducking on this journey through the bush and down the hill, coming to some slippery places in transit. The box cooly said "Appa Sami" and helped me over some queer places during the storm, but we reached Oonankande and met Mr. Gidlow who soon made us feel comfortable. Mr. John Drummond turned up in the evening and we had a talk of old times.

OONANKANDE is quite a new estate, the tea looks well and there is a good view of the low-country from the bungalow, looking out on the Kelani Valley. There is a fine estate under tea called YATADERIYA, Kegalla; it stands out in bold relief in the forests of the low-country. We got a bird's-eye view of this property from the vantage ground of Oonankande. Poor Mr. Gidlow has just lost his sister who was killed by lightning at Gangwarily estate just below Oonankande; the lightning split up two verandah posts and entered the bungalow under the ground, killing and injuring all the occupants of the room, then escaping and splitting a rock on the other side.

Taking advantage of a fine morning we came down through GANGWARILY, visiting the scene of the lightning accident and passing the bungalow of Mr. Kellow, the present Superintendent of Gangwarily, who had gone down to his factory by the river side; we crossed a bridge leading to the factory of Dedugalla and St. Blane, from where we could see the Gangwarily factory with its water-wheel working. Cacao is plentiful on Gangwarily and looking well and the tea is flourishing; there are twenty acres, giving fourteen hundred pounds to the acre. The new Company, called the Gangwarily Estates Company of Ceylon, Limited, includes Havilland, 340 acres of tea, on the opposite side of the river. There are 370 acres of land in cultivation on Gangwarily estate. The climb from the bridge to the DEDUGALLA bungalow was good manual exercise before breakfast and the Superintendent received us kindly, on our mentioning that we had once been in charge of Dedugalla and St. Blane; the teas made here were of very good flavour and the turbine drives the machinery. There is also a turbine on Havilland, doing excellent work. Around the Dedugalla bungalow we found some loquat trees and other plants of our own planting in 1876, twenty-five years ago. We opened up St. Blane in 1874 and found it a steep and hard working place; the ageratum and other fancy weeds, such as the Spanish Needle, were very plentiful, but now the properties look clean and in good order, and the tea made of very good flavour. We had not visited HAVILLAND since we took a very prominent part in a tragedy in 1874, but we will let bygones be bygones and pass that over. Havilland uses wire-shoots for transporting leaf and wood; a gradient of one in ten is considered safe for both wood and leaf, the runners travel very well and the coolies enjoy seeing the bags flying through the air. Liberian coffee looks healthy, and in bearing there are about twenty acres of Liberian coffee and about five of cacao. The old seed-bearers on both sides of the bridle path are fine bushes and their stems quite ten inches in diameter. Mr. Kellow came up to dinner and gave us much information about South Africa and his personal adventures as one of the Ceylon Contingent, but somehow the authorities have forgotten to send him his service medal and balance of pay.

We walked down to the factory of Havilland yesterday and saw the machinery working, driven by the turbine. The tea packer is an interesting machine and does good work; when it's in motion one can insert one's hand into the tea, but as soon as the machine is stopped it is impossible to put your hand into the centre of the chest. The fermenting drawers or trays, set up like a huge chest of drawers, attracted my attention. In visiting different tea factories there are many different ways of manufacture, and one learns a good deal. Returning from the factory your correspondent was treated to a ride instead of walking and managed to reach the bungalow of Havilland before the tea leaf was shot down the wire-shoot. Before dinner (7·30) we were sitting in the front verandah and suddenly caught sight of the comet to the West and to the left of the constellation Orion. We hope to see it again tonight as the weather is fine.—Yours faithfully, HENRY COTTAM.

[Can Mr. Cottam tell us about "Doolgala' block of land entered in the Directory for many years as belonging to the heirs of the late John Gordon.—ED. *T.A.*]

THE MIDLAND TEA PLANTATIONS COMPANY.—The report which we publish on page 52 contains a repetition of the tale, to which we have now become accustomed, of serious loss on the past season's working. We trust, however, that the finer system of plucking which has been adopted will have a beneficial result.

OUVAH COFFEE COMPANY, LIMITED.

REPORT

To be presented to the Sixth Ordinary General Meeting of the Company, to be held at No. 5, Dowgate Hill, London, on Tuesday, the 14th day of May, 1901, at 12 o'clock noon.

The following annual accounts are now presented to Shareholders, viz.:—

Balance sheet made up to 31st December, 1900.

Profit and loss acconnt for the year ended 31st December, 1900.

The receipts from the sale of prodnce were as nnder—

		£	s	d
Tea from the Company's own Estate	1,114,513 lb.			
Tea made from bought leaf	161,035 do			
Total	1,275,548 do	34,023	13	8
Coffee 478 cwts. 3 qrs. 5 lb. ..		1,861	7	3
Cocoa 56 cwts. 2 qrs. 17 lb., estimated value		150	0	0
Cinchona 22,609 lb., estimated valne ..		100	0	0
Plumbago 554 cwts. 3 qrs. 8 lb. ..		394	18	8
Sundry sales in Ceylon ..		99	19	7
Total receipts ...		£36,629	19	2

The total expenditnre in Ceylon and London amonnted to £28,908 3s 4d, and dedncting this from the valne of the produce a profit is shown of £7,721 15s 10d, to which has to be added the balance of £224 11s 9d, bronght forward from the previous year, making a total of £7,946 7s 7d at the credit of Profit and Loss. From the above snm the Directors have transferred to the credit of Badnlla Factory Account £1,000. The interim dividend of 2½ per cent., paid on 15th November, 1900, absorbed £2,500, and Income Tax £241 2s 3d, leaving a balance of £4,205 5s 4d, out of which it is proposed to pay a further dividend of 3½ per cent, making 6 per cent. for the year, and to carry forward to next acconnt the sum of £705 5s 4d.

Favourable weather was experienced during the past year, and the yield of tea per acre was 602 lb. as against 404 lb. and 438 lb obtained dnring the two preceding years. The tea market, on the other hand, has been over-snpplied. and our average selling price dropped to 6·40*d* against 7·56*d* at which the previons 17 months' crop sold. The lower cost of prodnction, bronght abont by the increased yield, has however to some extent compensated ns for the fall in the valne of onr produce. The returns from coffee, cocoa and cinchona diminish as these prodncts are replaced by tea. A heavy fall has taken place in the value of plnmbago, and for this reason mining has not been actively pushed during the past year. Operations have been chiefly directed towards proving the extent and value of the deposits. If a sufficient body of mineral is proved to exist, it could be mined profitably at present prices with the aid of modern appliances. All the Company's properties are reported to be in excellent condition and promising well for the future.

The acreage of the Company's property is now as follows:—

			acres.
Tea, over 5 years old			1,775
do Planted Nov.-Dec.		1896	151
do	do	1897	133
do	do	1898	23
do	do	1899	18
do	do	1900	40
Area nnder Tea			2,140
Area nnder Coffee and Cocoa			386
Area under Fuel			336
Forest, Patana and Waste			713
Total Areas			3,575 acres

Mr. L FAMIN, a member of the Board, retires on this occasion, and, being eligible, offers himself for re-election.

Messrs. DELOITTE, DEVER, GRIFFITHS & Co., the Anditors, also offer themselves for re-election.

By order, J. ALEC ROBERTS, Secretary.

London, 3rd May, 1901.

THE DIMBULA VALLEY (CEYLON) TEA COMPANY, LIMITED.

REPORT

To be submitted to the Shareholders at the Fifth Annnal Ordinary General Meeting, to be held at the Cannon Street Hotel, on Wednesday, 8th May, 1901, at 12 o'clock noon.

The Directors, in accordance with the intimation given at the general meeting on the 25th June last, that the accounts would henceforth be made up as at 31st December. instead of 31st March, beg to submit the General Balance Sheet and Profit and Loss Account for the nine months ending 31st December last.

After bringing forward £1,987 13s 7d from las account, and providing for general expenses, London Office expenses, Superintendents' commissions and £380 8d for depreciation, the net amoun at credit of profit and loss acconnt for the nine months ending 31st December last is £13,293 9s.

A dividend of 3 per cent., less income tax, has been paid for six months on the preference shares, amounting to	£1,720	1	0
An interim dividend of 3 per cent., less income tax, has been paid on the ordinary shares. and amounts to	3,439	19	0
It is proposed to pay a final dividend of 4½ per cent. on the ordinary shares, making 7½ per cent. for the nine months, or at the rate of 10 per cent. per annnm, absorbing a further sum of	5,159	18	6
It is proposed to carry to reserve fund a sum of	1,000	0	0
Leaving to be carried forward	1,973	10	6
	£13,293	9	0

The crop amonnted to 803,672 lb. to 31st December.

To enable Shareholders to judge how the 12 months would have worked out, had the year closed on the 31st March as heretofore, it may be stated that the yield for January, February, and March has been 315,000 lb., thus giving a total of 1,118,672 lb., against 1,079,829 lb., for the previous 12 months, or an increase of 38,843 lb.

The cost of cnltivation and placing the crop on board ship was 26·97 cents, against 25·77 cents the previons year. It mnst, however, be explained that the reason for the somewhat higher cost is that all expenses connected with the cultnre of the tea fields fell npon a nine instead of a twelve-months' season. Jannary, February, and March teas, having to bear only the cost of management, plucking, weeding, and manufactnre, would have brought down the cost well nnder last year's.

The total crop, inclnding 50 cwt. coffee, realised £27,405 18s 8d, or an average, for the tea, of 8·98d, against 9·40d last year and 10·09d for the previons season.

The Directors regret losing the services of Mr. Melville White as Manager in Ceylon, owing to his retirement from the Colony. He has been succeeded by Mr Herbert Sinclair, a gentleman holding a large interest in the Company, and who has been in its employ since its inception.

The Managing Director recently visited Ceylon, and reports favourably on the condition and general appearance of the Company's Estates.

It is with extreme regret the Directors have to record the loss the Company sustained during the year by the death of their colleague, Mr. Æ. R. Macdonell.

Mr. D Erroll Sinclair has been appointed to the Board of Directors.

Mr. Theodore C Owen retires by rotation, but, being eligible, offers himself for re-election.

Messrs. Singleton, Fabian & Co., the Auditors to the Company, retire, and, being eligible, offer themselves for re-election.

JAMES SINCLAIR, Managing Director; ROWE, WHITE & Co., Secretaries.

29th April, 1901.

THE SOUTH WANARAJAH TEA ESTATES, LIMITED.

REPORT OF THE DIRECTORS.

The profit for the season, after writing off £250 for depreciation, is £1,490 19s 2d; out of which a dividend at the rate of six per cent on £7,000 preference shares has been paid, £420, leaving a balance of £1,070 19s 2d; from this the Directors recommend the payment of a dividend at the rate of five per cent on £20,000 ordinary shares, free of income tax, £1,000; and propose to carry to the next account the balance, £70 19s 2d.

The tea crop for the season, including that made from bought leaf, amounted to 592,641 lb. and the net average price was 4·93d per lb. The past year was generally unfavourable for tea producers, but the Directors are glad to be able to recommend a dividend of five per cent on the ordinary shares, after making a provision for depreciation to the extent of £250. The rate of exchange was 1s 4¼d per rupee. To meet the unsatisfactory state of the tea market, owing chiefly to excessive supplies of inferior kinds, which forced prices down, the Directors have decided to adopt a finer style of plucking, and it is hoped that this system, coupled with close attention to manufacture, will enable the Company to secure better prices for the coming season's crop. The estates and buildings are reported by the Managing Director to be in good order. The acreages of the Company's estates are as follows:—South Wanarajah, 230 tea, three year's old and over; 25 grass, &c.; total 255—Dartry, 612 tea, three years old and over, 24 young tea, 44 grass, &c., total 680.

Under article 95 Mr. T. J. Lawrance resigned his office of Director, and the Board appointed Mr. William Figg to the vacancy. Under article 97 Mr. Figg retires, and, being eligible, offers himself for re-election. The appointment of auditors rest with the shareholders and Messrs. Fuller, Wise and Fisher offer themselves for re-election.

HUNASGERIA TEA COMPANY, LIMITED.

REPORT OF THE DIRECTORS

to be presented to the sixteenth ordinary general meeting of the Company on 14th May 1901, at 1 o'clock p m, for the year ended 31st December 1900:—The tea crop amounted to 479,170 lb, which sold in London for £10,432 13s 8d, giving an average selling price of 5·22d per lb. The ordinary expenditure in Ceylon and London amounted to £11,112 15s 11d, showing a loss of £680 2s 3d on the year's working. A credit balance of £152 16s 0d was brought forward from last year and, after deducting this, there is a sum of £527 6s 3d at the debit of profit and loss account. The area under tea remains at 763 acres of which 31 acres are only in partial bearing. A severe drought, extending over 2½ months, was experienced during the early part of the year, but it is satisfactory that in spite of this a good yield has been obtained, the return from the 763 acres in bearing being 628 lb of made tea per acre against 613 lb and 414 lb secured during the two previous years. Cultivation has been well maintained and extended to the whole tea area and from an agricultural point of view expectations have been fully realised. The loss on this year's working is entirely due to the adverse market position. Last year's shipments of medium quality tea from Ceylon and India proved to be largely in excess of requirements and a heavy fall in value resulted. Our average selling price fell from 6·67d to 5·22d per lb. To meet the situation finer plucking has been almost universally resorted to in Ceylon, which while improving the quality will reduce the quantity coming forward, and it is to be hoped that this will tide over the present glutted condition of the market. Mr P C Oswald, a member of the Board, retires from office on this occasion and, being eligible, offers himself for re-election; and Messrs J & J Sawyer & Co, the Company's Auditors, also offer themselves for re-election.

THE ANKANDE ESTATE COMPANY OF CEYLON LIMITED.

Report of the Directors to 31st March, 1901.

ACREAGE		acres
Tea	..	156
Cocoa and Liberian Coffee		104
Cardamoms	..	95
Jungle	..	197
Total	..	552 acres

The Directors have now to present to the Shareholders the Report, Balance Sheet, and Profit and Loss Account for the 15 months ending 31st March, 1901. Owing to the decline in value of tea during the period covered by this Report, and also to the short crop of cocoa, the result is far from being satisfactory.

Interest to the vendors was paid up to 30 June, but it has since been in arrears.

The total crops harvested during the period have been from

ANKANDE—Tea		..	71,024 lb
	Cocoa	..	52-3-13 cwt
GLENURY	Tea, Green Leaf		12,679 lb
	Cocoa	..	45-0-9 cwt
ALTWOOD	Cardamoms	..	5,335 lb

Depreciation amounting to R278·81 has been written off from Profit and Loss Account.

The Directors regret that, under the circumstances disclosed by the Profit and Loss Account, they are unable to recommend any dividend distribution on this occasion.

Mr. John Aymer retires by rotation and is eligible for re-election.

The appointment of an Auditor for 1901 will rest with the Meeting.—By order of the Directors,

BAKER & HALL, Agents and Secys.

Colombo, May 22nd, 1901.

PUNDALOYA TEA COMPANY OF CEYLON, LIMITED.

REPORT

To be presented at the Fourth Ordinary Annual General Meeting of the Company to be held at the Office of the Company, on Tuesday, the 7th May, 1901, at Twelve o'clock noon.

1. The Directors now submit their Report for the year ending the 31st December, 1900, together with the Balance Sheet and Accounts of the Company, made up to that date, and duly audited, and they regret th

the Accounts have been unavoidably delayed, owing to the serious illness of the Manager of one of the Estates in Ceylon.

2. The Tea Crop amounted to 697,359 lb. of which 697,155 lb. shipped to London realised a gross average of 8·68d per lb. The crop exceeded that of 1899 by as much as 52,794 lb., chiefly owing to unusually favorable weather, but the average price of tea has been tending steadily downwards during the year, while, in consequence of excessive stocks and supplies, the state of the market is far from satisfactory, and there is at present little prospect of any permanent improvement.

3. During the year 42 acres have been cleared and planted with tea, which practically completes all the extensions contemplated. The young tea planted during the past four years is reported to be coming on well, and the earlier clearings will contribute something towards the crop of 1901.

4. The following statement gives details which may be of interest:—

Season.	Acreage Plucked.	Total Tea Crop.	Yield per Acre.	Cost of Crop per lb. f.o.b. Colombo.	Gross Average price obtained per lb Tea.	Average rate of Exchange per Rupee.	Dividend on Ordinary Shares free of Income Tax.
	acres.	lb.	lb.	d.	d.	s. d.	per cent.
1900	1,640	697·359	425	4·86	8·68	1 4 17-64	6
1899	1,640	644·565	393	4·81	9·28	1 4 9-32	6
1898	1,640	627·886	383	5·29	9·27	1 4 3-16	6
1897	1,640	623·699	380	5·22	9·52	1 3 3-8	6

5.

	£ s. d.	£ s. d.	£ s. d.
The net profit for the year amounted to ..		£7,857 10 7	
To which has to be added Interest ..		170 18 11	
And the Balance from last year of ..	£626 9 0		
Less Factory Extensions ..	288 0 0		
		338 9 0	
Making a Total of			£8,366 18 6
The Directors have already paid, out of this, Interest for the year upon the Mortgage, less Income Tax ..		£436 3 1	
Dividend for the year upon the 6 per cent. Perference Shares, less Income Tax ..		1,889 5 0	
Income Tax ..		216 14 8	
And they propose to deal with the Balance as follows:—			
To pay a Dividend of 6 per cent., free of Income Tax, on the Ordinary Shares, requiring ..		3,960 0 0	
To Transfer to Reserve for Depreciation and General Purposes (increasing this Account to £6,000) ...		1,500 0 0	
To write off cost of Investments ...		100 0 0	
And to carry forward the balance of ..		264 15 9	
			£8,366 18 6

6. The Director retiring on this occasion is Mr. Edward Christian who, being eligible, offers himself or re-election.

7. Mr. John Smith, the Auditor also retires, and offers himself for re-election.—By order of the Board,

ROBERTSON BOIS & Co.,

Agents and Secretaries.

12, Fenchurch Street, London, E.C., 29th April, 1901.

SCHEDULE OF THE COMPANY'S ESTATES, ON 31ST DEC., 1900.

Estate.	Tea in full and partial beaing.	Tea not in bearing.	Forest and Patana land.	Fuel and Timber Plantations.	Grass land, Buildings & Waste.	Total.
Sheen	482	204	112	45	52	895 acres
Pundaloya	452	43	25	19	95	634 „
Wootton	306	8	—	39	25	378 „
Deeside	400	—	10	—	26	436 „
Total	1,640	255	147	103	198	2,343 acres.

CEYLON PROPRIETARY TEA ESTATES COMPANY LIMITED.

REPORT OF THE DIRECTORS

to be submitted at the fourth annual ordinary general meeting of shareholders, to be held at the Office of the Company, on Monday, 20th May, 1901.

The Directors herewith submit the general balance sheet and profit and loss account for the year ending 31st December, 1900, duly audited.

	£ s. d.	£ s. d.	£ s. d.
The net amount at Credit of Profit and Loss Account after providing for General expenses, Income Tax, &c., is			4,695 16 0
Debenture Interest paid to 30th Sept., 1900 (*less* Income Tax) amounts to	£718 15 0		
Less from last account	181 5 0		
		537 10 0	
Three months' Debenture Interest to 31st December, 1900 (*less* Income Tax) amounts to ..		178 2 6	
Preference Dividends paid for 1900 (*less* Income Tax) amount to ..		1,246 9 6	
Interim Dividend of 1½ per cent. on the Ordinary Shares paid 31st October, 1900, amounts to ..		1,175 14 0	
It is proposed to pay a final Dividend of 1½ per cent. on the Ordinary Shares (making 3 per cent. in all, free of Income Tax) which will absorb..		1,175 14 0	
And to carry forward to next year a balance of..		382 6 0	
			£4,695 16

During the past year the Comany's estates have given an increased crop of tea of 89,047 lb., the yield per acre being 490 lb. against 439 lb. in 1899 and 407 lb. in 1898.

The gross price realised for the teas sold in London and Ceylon averaged 6.10d as against 7.11d last year, and the average rate of exchange is the same as last year, viz: 1s 4 13-32nds.

The profits of the Company have been seriously diminished owing to the general fall in the market for teas grown at medium and low elevations.

The following statement shows the results of the working of the Company for the last four years:—

Year.	Acreage of Tea in bearing.	Yield per Acre.	Rate of Exchange.	Sale price of Tea.	Esate Tea	Bonght Leaf Tea.	Tea Manufactnred for others.	Total.	Profits.		
	lb.	lb.	per R	d.	lb.	lb.	lb.	lb.	£.	s.	d.
1897	2,100	413	1/3 15·32	6.90	868,710	32,799	89,307	990,816	6,277	6	9
1898	2,105	407	1/4 15·64	6·94	857,351	38,530	94,370	990,251	4,834	3	11
1899	2,111	439	1/4 13·32	7·11	927,395	61,772	1,681	990,848	6,790	2	5
1900	2,071	490	1/4 13·32	6·10	1016,442	99,351	3,331	1,119,124	3,690	19	3

A re-snrvey has been made of a portion of the Company's lands, and according to this there are 2,269 acres planted with tea, and the total area of the estates is 2,995 acres.

Under Clause 69 of the Articles of Association Mr. H K Rutherford retires from the Board on this occasion, but, being eligible, offers himself for re-election.

The Auditors, Messrs. Harper Brothers, Chartered Accountants, retire from office and offer themselves for re-election.—By order of the Board,

WM. JOHNSTON, Secretary.

London, 11th May, 1901.

THE MIDLAND (CEYLON) TEA PLANTATIONS CO. LTD.

REPORT OF THE DIRECTORS

to be submitted to the shareholders at the ordinary general meeting, to be held on Tuesday, 21st May, with the accounts, duly audited, for the year ending 31st December, 1900.

The receipts for the season are £7,198 13s 2d., *less* working expenses in Ceylon £6,858 18s 3d., leaving gross profit £339 14s 11d. And the following being also chargeable :—Debenture interest—6 per cent. per annum on £15,000 £900; interest—of loans £175 6s 1d. : fees to trustees and auditors, office expenses in London, &c., £107 5s 3d, = £1,182 11s 4d. ; the loss on the season's working is £842 16s 5d. Deducting the balance of profit for 1899, £300 6s 8d, the deficiency is, as shown in the balance-sheet, £542 9s 9d.

It is with much regret that the Directors report such a serious loss on the season's working, this Company having suffered in common with others from the severe depression in the tea market, resulting from supplies both from Ceylon and India during the greater part of the year being in excess of the requirements of the trade. The account being so unfavourable, the Directors have again waived their fees, and the London Agents have reduced their charge for office rent and secretarial work. Owing in a measure to the very wet weather from June to October the crop was a little short of estimate, and the amount obtained was 376,499 lb., which realised a net average price of 4·54d. per lb. The rupee exchange for the Company's business averaged 1/4·15 per rupee. The acreages under cultivation are :—Over four years old 966, under two years old 75, total 1,041 ; and the crop for the season is estimated at 385,000 lb, of which there have been sold to date 32,675 lb, at a net average price of 5d per lb. Every effort is being made by the staff in the East towards maintaining the efficient and economical working of the estates, and a somewhat finer system of plucking is now adopted, it being expected that this change will be beneficial to the Company. Under the Articles of Association, Mr W Dunn retires from the Board and, being eligible, offers himself for re-election. The auditors, Messrs Brown, Fleming and Murray, also retire and their re-appointment remains with the shareholders.

THE GREAT WESTERN TEA CO. OF CEYLON, LTD.

Report of the Directors for presentation to the general meeting of the shareholders, to be held on Saturday, the 8th June, 1901, at noon.

Directors:—J. C. Dunbar, Giles F. Walker, James Ryan, A. Cantlay.

The Directors submit their Annnal Report and Acconnts for the Season ending March 31st, 1901.

The yield of Tea has been 428,510 lb., being an increase of 12,535 lb. on last season's crop : the price realized on 365,850 lb. for which account sales have been received is 48·91 cents per lb. against 48·96 cents last season, and 48·74 cents in 1898-99, a very satisfactory price in view of the lower range of the market.

The Cost F.O.B. Colombo is 31·71 cents per lb. (including 4·77 cents for manuring) against 31·27 cts. (inclnding 4·23 cents for manuring) last season.

Estimating the unsold portion of the crop at a safe figure, the amonnt available for distribntion, after setting aside R6,079·19 for depreciation, is R64,728·85 ont of which the Directors recommend the payment

of a dividend of 10 per cent absorbing ...	R58,400 00
To place to Reserve Acconnt a snm of	5,000 00
And to carry forward the balance of ...	1,328 85
	R64,728 85

The resnlt of the year's working is fully equal to that of the previous season in spite of a lower market, as last year the balance carried forward from 1898-99 was R7,416·88 or R5,640·78 more than the balance carried forward to this season, while the general condition of the estate is at the present time greatly improved, owing to the good and careful work done by the Superintendent.

The estimated crop for the cnrrent season is 420,000 lb., to cost R133,975·00, being at the rate of 31·89 cents per lb. tea inclnsive of 4·49 cents for manuring, but from the present condition of the estate and the yield to date the Directors are now of opinion that the estimated crop will be exceeded

The Acreage of the Estate is

A.	R.	P.	
921	2	12	Tea in bearing.
39	0	0	Fuel clearing.
38	2	4	Ravines.
17	1	12	Grass field.
11	3	13	Building and Gardens.
30	0	14	Cart Road and Roads.
23	2	25	Railway.
1,082	0	0	

In terms of the Articles of Association Mr. James Ryan retires by rotation, and being eligible offers himself for re-election.

It will be necessary to appoint an Auditor for season 1901-02.

By order of the Board of Directors,
J. M. ROBERTSON & Co., Agents & Secretaries.
Colombo, 25th May, 1901.

SPRING VALLEY COFFEE COMPANY, LIMITED.

REPORT

To be presented to the thirty-seventh ordinary general meeting of the Company to be held at No. 5, Dowgate Hill, London, on Tuesday, the 14th day of May, 1901, at 12·30 o'clock p m.

The following annual accounts are now presented to shareholders ;—Balance sheet made up to 31st December, 1900. Profit and loss account for the year ended 31st December 1900.

The crop of tea for the past season amounted to 656,220lb, and this, together with 15,845lb bought from neighbouring estates and manufactured at Spring Valley, sold for £19,062 19s 5d; the average selling price being 6·81 pence against 7·73 pence obtained for the 1898-99 crop.

The crop from the few remaining coffee trees amounted to 173 cwts 3 qrs 2 lb, and realised £592 5s 11d, being at the rate of 68s 2d per cwt against 62s 10d obtained for the 1898-1899 crop. Coffee sold in Ceylon to the value of £29 15s 6d.

The total proceeds from the sales of produce amounted to £19,685 0s 10d and expenditure in Ceylon and London to £16,007 0s 1d, leaving a profit on the year's working of £3,678 0s 9d. To this profit has to be added a sum of £240 10s 4d brought forward from last Account, and after debiting £15 12s 11d for Income Tax and £1,275 for Dividend on the Preference Share Capital for the seventeen months ended 31st December, 1900, there remains a balance of £2,627 18s 2d to be now dealt with,

The Directors recommend the payment of a Dividend of 2½ per cent. on the Ordinary Capital, which will absorb £2,000 of the above sum, and that the balance of £627 18s 2d be carried forward to next year.

Good flushing conditions prevailed during the year under review, and a crop of 482 lb. of made tea per acre was gathered, which compares with 326 lb. secured during the year 1898-99.

Cultivation and manufacturing accommodation and appliances are being well maintained, and the tea planted in recent years promises well.

The only unfavourable feature is the tea market. Prices have been steadily falling for a long succession of years, and the heavy supplies, more especially of common sorts, that came forward from Ceylon and India last Autumn, caused a further severe shrinkage in values.

This is being met by finer plucking on most Ceylon gardens, and the improved quality and anticipated smaller supplies have already had a beneficial effect on quotations.

Present conditions must arrest further extensions, whilst the consumption of tea should be stimulated, and it is hoped that these causes will operate to raise values to a figure that will leave a fair margin of profit to the grower. The area of the estate as on 31st December, 1900, was as follows :--

Tea 5 years old and over	..	1,362 acres
Planted November-December 1896	..	159
,, 1897	..	194
,, 1898	..	196
Total under tea	..	1,911
Total under fuel	..	163
Forest, &c	..	257
Oolanakande estate	..	365
Total area	..	2,696 acres

Oolanakande Estate, comprising 100 acres of tea, has been let on lease for a term of years at a nominal rental. The lease has now expired, and the cultivation of the Estate by the Company is for the present suspended, as it is found to be unremunerative.

Mr. P. C. OSWALD, a member of the Board, retires on this occasion and, being eligible, offers himself for re-election.

Messrs. DELOTTE, DEVER, GRIFFITH & Co., the Auditors, also offer for re-election.—By Order,
London, May 3, 1901. J. ALEC ROBERTS, Secy.

THE MALAY STATES COFFEE COMPANY, LIMITED.

The Directors beg to submit to the Shareholders their report and accounts for the year ended February 28th, 1901.

During the year 79·97 piculs of coffee were secured, netting R2,385·59, this being slightly in excess of the amount estimated. The balance of the Capital has now been called up and it is calculated that the funds in hand will be sufficient for the working of the Estate until March, 1902, when it should be self-supporting. The cultivated acreage is now as follows :—

144 acres of coffee (from which 300 piculs is estimated as the crop for season 1901-1902.) 50 acres of Rubber planted 12' × 12'

34 acres of the Coffee has also been planted with Rubber 20' × 10' and with Coconut 54 trees to the acre, the remaining 110 acres of Coffee has likewise been planted with Rubber 20' × 20' and with Coconuts. The Rubber is all coming on well and we are advised by the Superintendent that the older trees are branching out, 8 to 10 feet up the stem.

The Directors have to record with much regret the death of their colleague, Mr. W Sandys Thomas. Messrs F W Bois and W Kingsbury have, owing to their departure from the Island, resigned their seats on the board, and the three vacancies have been filled up by Messrs. J Ryan, H G Bois and E M Shattock.

In terms of the articles of association Mr. V A Julius also retires from the Directorate but being eligible offers himself for re-election.

It will also be necessary to appoint an auditor for season, 1901-1902.

"SOME NOTES ON COCOA PLANTING IN THE WEST INDIES"—is a neat little pamphlet of 70 pages, by our London "Cocoa Correspondent," Mr. H Hamel-Smith, and contains a good deal of useful information, more particularly in reference to the industry in Trinidad and other West Indian islands, with estimates of cost of opening a plantation of this product (also of bananas,) and of the best means of improving the product. The author holds the opinion strongly that the world wants more cocoa than is as yet available and yet Trinidad exported over 260,000 cwt. in 1899.—Copies of the little work (published at 1s nett) will be made available locally very soon,

THE TEA TRADE.

According to an old newspaper, the tea habit is much more universal than is commonly supposed, as the following schedule will prove:

People of all classes take tea. Dead people take eterniT; gay people, festiviT; nice girls, puriT; free people, LiberT; fashionable folks, socieT; good people, pieT: succesful candidates, majoriT; editors, honesT; solemn citizens, graviT; funny roosters, leviT; orthodox citizens, deiT; polite people suaviT; bashful fellows, modesT; kind ones, chariT; bachelors, singulariT; short people, breviT; cunning folk, rascaliT; romantic simpletons, novelT; respectable people, ChristianiT; artistic people, beauT; strong people, responsibiliT; criminals, penaltT; vicious cusses, enmiT; grocers, varieT—but the T-pot cracked at this juncture.

Among the fragments were found: Wedded couples, feliciT; Mormons, multipliciT; Quakers, tranquiliT; the asylums, insaniT, mediciT, poverT, &c.; pretty girls. incomprehensibiliT; lovers, uniT; everybody, longeviT; the one who does not pay his subscription, T-total depraviT.—*American Grocer* May 1.

CACAO DISEASE IN TRINIDAD.

MR. MASSEE'S REPORT.

Some time during the end of the year 1900, I received an enquiry from Surinam as to whether I had noticed in Trinidad a disease attacking the branches of cacao trees and causing growth in bunches like the European "Witches Brooms" or "Hecksenbesen." I was glad to answer that I had not yet seen such an appearance among our Trinidad trees. It was reported from several independant sources that the disease was very prevalent and did a large amount of damage to the trees, seriously affecting the crop. Specimens were kindly procured for me, and these on examination proved to be infected with one of the Fungi known to cause abnormal growth of the branches, running into knots or "brooms." The specimens were sent on to the Director, Royal Gardens, Kew, and attached is the Report of Mr. Massee the Mycologist who examined them:—

"*Exoascus Theobromæ*, Ritzema Bos, is the provisional name given to the Fungus parasitic on the Cacao branches, causing witches' broom thereon The Author of the species could not find the fungus in a fruiting condition, neither did the material forwarded to Kew furnish fruit. Material should be sent at the time when the tips of the twigs are only slightly swollen, and covered with a white delicate bloom. In much swollen branches the fruit of the fungus has entirely disappeared and the persistent or perennial mycelium of the fungus can only be found. Owing to the perennial mycelium a crop of spores is produced each season on the diseased branches; such spores being spread to neighbouring trees by wind, &c., extends the disease. If it were possible to remove all diseased branches, the disease would soon disappear, but as this is hardly possible, in addition to removing as many diseased shoots as possible, it is advisable to spray with dilute Bordeaux mixture from time to time, so as to prevent the inoculation of young twigs and leaves."

It would be nothing short of a serious calamity were the infection introduced into this Colony, and steps have been taken with the view of securing effective regulations to prevent such an occurrence. Similar growths are to be observed in many trees growing in this Colony, Arabian coffee being considerably troubled, but not so as to seriously affect its growth or productiveness. This, however, is not the same as attacks cacao, but is related thereto. It is probable that in the course of Nature many diseases exist among our indigenous trees which, on the occurrence of suitable conditions might attack and destroy many cultivated plants as did the *Hemeleia* with Ceylon coffee, and a careful watch is necessary for the first indication of disease, so that measures can be devised for its suppression before the damage becomes too extensive to be effectively dealt with. The disease of which we write is an easily recognised one and cultivators may see a preserved specimen showing its character, in the Herbarium of this department. In any case, where trees appear to be suffering, the department would be glad to receive and secure the determination of specimens which may be thought to be diseased.—Trinidad *Bulletin*.

CHEAP NITROGEN.

After four years of research and application, Sir William Crooke, the eminent agricultural chemist, has solved the problem of furnishing nitrogen to the plant world at a cost which brings this all-powerful stimulant and renovator within the means of the poorest cultivator. Hitherto nitrates have had to be imported from far-away scattered deposits and, though of recent years the price has been brought down to between £7 and £10 per ton, this has proved far beyond the means of the average horticulturist and farmer. Sir William now separates the gas direct from the atmosphere by electricity, and, although the experiment of fitting the nitrates so obtained for commercial purposes was costly, the product was sold at a remunerative profit of £5 per ton.—*Indian Planters' Gazette*, June 1.

TEA PLANTING IN ASSAM: THE OFFICIAL REPORT.

Cacutta, 7th June.—The official report of tea planting in Assam during the past year gives the total number of gardens as 8041, against 815 in the previous year, the total area being returned at 1,059,624 acres against 1028,431 in 1899. The number of persons employed permanently increased from 457,343 in 1899 to 468,326 during the year under report. Over 97 per cent. of the area under tea is in European hands, while less than 3 per cent. is owned by natives. The total outturn was 141,118,644 lbs. against 128,371,857 lbs. in 1899, showing an increase of 12,746,787 lbs.—*Madras Mail*.

GEM MINING IN CEYLON.

With the exception of the diamond, emerald, turquoise, and opal (says a writer in *Kuhlow's German Trade Review*) almost every precious and semi-precious stone is found in Ceylon, and frequently a great variety of them are dug out of the same pit. Rakwana is especially famed for its sapphires. Spinels of all colours and garnets are almost invariably found in conjunction with the other stones; also the different varieties of zircon, commonly termed jargoon. Cat's-eyes are usually found together with aquamarines and the different kinds of beryl, of which the alexandrite is the most sought after. A good proportion of the stones found are cut locally in the village of Ratnapura and in Kalutara, a small place on the coast some 40 miles south of Colombo.—*Globe*.

THE CEYLON TEA CESS FUND.

We have been compiling some figures for our Handbook in reference to the above Fund and the outlay by the "Thirty Committee" which may be of interest to planting readers. The Cess Collection was provided for by Ordinance No. 4 of 1894—an Ordinance to provide for the continuance of the Export Duty on Tea levied under Ordinance No. 15 of 1892. The collection commenced the next year and, so far as we can make out, the total collection up to the end of 1900 was R3,140,333; but of this R155,799 up to the end of October, 1894, was taken for the Chicago Exhibition, leaving R2,984,534 to be dealt with by the "Thirty Committee." Up to the end of 1897, their outlay was R575,141; during 1898 it was R531,344; in 1899 it equalled R726,799, while it rose to R1,069,209 last year, and yet apparently, so far as we can judge, there should be a balance of R82,000 over on 1st January last? We make the total receipts

to be	R2,984,534
Against disbursements	R2,902,493
Balance	R82,041

Of special interest is it to know that the total of votes for America would seem to be R1,421,255 or not far short of £100,000, or between 400,000 and 500,000 dollars. For Europe altogether, including Mr. Rogivue's votes, the total would seem to be about R1,033,950.

The total votes for Russia, so far as we can judge, amount to R275,957 and for the rest of Europe, including the Paris Exhibition, R757,975. Very likely some corrections may be necessary on our figures; but we think they should be found to be at least close approximations.

Now, the point is what have we got in return for nearly £100,000 spent in America. It is true, as some one has said, that Canada should not be taken so much into account, because the people there were bound to become more and more customers for Indian and Ceylon teas. It was the United States that had to be fought for, and all we need say now is that if there had been no "subsidising"—partial and more or less mysterious—but open frank advertising of a good article, with "demonstrations" at all State Exhibitions, we cannot believe that more customers for our teas, and permanent ones too, would not have been won, than by the policy actually pursued. We know advertising was partially tried, chiefly through dealers—so gaining a temporary trade in our teas; but the object should have been to gain the notice of the masses in the way in which every great advertiser with a good article goes to work.

TRADE IN CEYLON: COLOMBO AND GALLE.

We have received the following remarks on the present condition of Ceylon trade, more especially among the natives, which come to us from a correspondent at the leading port of the South:—

"The article on Madras steamer freights reproduced from the Madras Mail in the *Observer* of the 24th ult. affords some interesting information *re* the cute Bombay trader. It appears he has encroached on the Piece Goods trade of the Madras Presidency; and in Ceylon, too, we find the same element in active competition with the ubiquitous Moorish trader. The latter complains that he can make no profit on his cotton goods, although he imports them direct from Europe, so long as the Bombay trader can afford to undersell him. It was thought at one time that inferior goods, unsaleable in Bombay, were sent to Galle; but the secret leaks out now. 'J W' explains that the Dealers' Association contract price from Manchester to Bombay is 10s 6d per ton measurement with ten per cent primage. With such cheap freight, the Indian merchant is well able to secure a margin, notwithstanding the additional expense entailed on re-shipments to Galle or Colombo.

"The Maldive Islands' trade, which was formerly in the hands of the Moormen and gave them very lucrative returns, is now monopolised by Bombay capitalists. These latter have their representatives in Galle and Colombo, and carry on an extensive business in coconut oil, Bombay flour, curry-stuffs, etc.

"Since the Indian coasting steamers commenced to bring regular supplies of rice from Calcutta and the coast, the Chittagong rice trade has been extinguished. The Chittagong crafts traded regularly between that port, Galle, the Maldives, and Calcutta, and found here a ready market for their rice and paddy—but at present the grain trade is mostly in the hands of Chetty firms with agencies in all the principal rice ports, who effectually combine to discourage outside competition.

"Another feature of local trade is, that of late, with the acquisition of capital acquired during the plumbago boom, Sinhalese dealers have entered into keen competition with the Moormen and Parawas in the retail shop-keeping line.

"It is obvious therefore that our friend, the Tamby, is being gradually ousted from many of his happy hunting grounds. Even the trade in precious stones which has enriched so many Moor dealers is doomed—if the large finds of rubies and blue sapphires reported as having been discovered in the United States and Canada prove to be equal to the Ceylon specimens."

With regard to what is said above we have made enquiries in a reliable quarter and have found everything that is said confirmed. What is stated is only too true. Freights from Manchester to Bombay are a half, or a third, of what we have to pay to Ceylon. The quantity sent out to the former place being so enormous, the rates are low, and thus the dealers have a pull. With regard to remarks about the local trade and Sinhalese dealers having entered into keen competition, as a result of the plumbago boom at Galle, the same may be said of Colombo. During the last year or two, travellers for European houses have come to Colombo in large numbers, showing samples through native agents, and taking orders for quantities of goods far in excess of what the market could take off.

We understand that the Banks in London are much to blame for granting facilities for

over-trading, by buying bills on natives in the way they have done; the consequence is that the place is full of goods, for which there is a limited sale. Bills cannot be met, and large stocks are held practically in pawn, stocks which should never have been imported. The best thing those interested could do with them would be to send them back to Europe.

CEYLON DIRECTORS AND COMBINATION.

(To the Editor, *Home and Colonial Mail.*)

SIR,—The remarks from the chair at the recent meetings of Ceylon tea companies, so far as they refer to the question of over-production of tea, are singularly unsatisfactory: They bring into prominence the question of whether directors are justified in taking upon themselves and imposing upon their constituents the risks involved by ignoring the present and prospective perilous position of the tea industry. The statistics of the last half-dozen years show, in spite of increased consumption, that there has been during that period a continually increasing excess of production over consumption to the extent of upwards of 50 million pounds of tea. The leading brokers are urging upon producers to take note of the Board of Trade returns, and warn them that, if surplus production is to go on increasing on the present scale, prices are likely to be even further reduced. Yet, with these and other equally serious facts before them, what was the attitude of the directors at the recent meetings? Several advocate a policy of drift, glibly disposing of the difficulty by stating that matters will right themselves by the simple law of supply and demand; a simple law, certainly, though, in the sense they intend it, not one to be contemplated with equanimity by shareholders. Then with regard to the late proposal to curtail output by mutual agreement as a remedy—which, by-the-bye, has fallen through entirely from the supine indifference or active opposition of Ceylon planters—some directors excuse themselves by expressing the opinion that it was not practicable, that it is difficult to get planters to combine for such a purpose. Indian planters showed that it was quite possible. Others were of opinion that there would be a sufficiently reduced yield, because a system of plucking finer leaf would be adopted by planters, though a reference to their own estimates of yield for the current season showed that they had framed estimates for an equal or increased yield. Expression was given to an opinion that it was even doubtful whether times were so bad that any combined effort to alter the position of the tea market was necessary. It would be interesting in this connection to know at what point such combination would become necessary. It is said there are some 70 or 75 per cent. of Indian and Ceylon tea companies that are not paying. Some companies are calling up the unpaid balances on shares, others are re-arranging their capital. Bankers are hesitating about giving facilities for credit to companies. Large areas of new plants are coming into bearing. As no agreement exists among planters as to output, the current season's crop may be as heavy as, or even heavier than, the last, for probabilities are that those planters who commenced the season by plucking finer leaf in order to reduce output may revert to coarser plucking and a larger yield if prices should not sufficiently improve, and in the face of the present vast accumulation of tea in stock it is most likely prices, even for fine teas, may be disappointing.

Can such a state of things be considered as not sufficiently serious to render some co-operative movement necessary?

It was remarked by one director—whose utterances, however, were somewhat of the hot and cold order—that "planters have it absolutely in their own hands, on the day they combine, to alter the whole complexion of the tea market." Let planters then see to it that they combine, lest the tea market alter the whole complexion of the planting community.

There need be no denying the fact, indiscriminate rivalry—in other words, cut-throat competition—has reached its limit. We have passed the days of long profits, when wild and reckless rivalry was possible. We are now in a period of close-margin profits, when all kinds of combination among buyers, carriers, &c., beset the industry on all sides.

Shareholders are usually slow to attribute blame to those who represent them, except in times of disaster, when, of course, it is too late. They are, however, becoming anxious. It has even been suggested that a shareholders' league might be serviceable.—Yours faithfully,

JAMES HODGES.

Birmingham, May 21, 1901.

[Our correspondent is in error in stating that the excess of production over consumption is to the extent of upwards of 50 million lb. Last year it was 20 million lb. in excess, and the previous year 14 million lb.]

GREEN TEAS FOR EGYPT AND NORTH AFRICA.

A colonist recalls an enquiry made of him in Egypt ten years ago for "green teas" which were said to be in great request for the Soudan. He wishes to know if samples of Ceylons are being sent to Egypt, Tunis, Algeria and Morocco?

A CURE FOR DYSENTERY.—Dr. Mougeot, whose investigations into the subject of a cure for dysentery have been attracting attention in Saigon for some time past, now claims to have discovered a remedy for the disease. This is the seed of the plant named *Brucca Sumatrana*, belonging to the family *Simarubaceæ*, which is found in those parts of Southern China, Lower India, the island of Sunda and tropical America where the malady prevails in its more virulent form. Both the tree and its seed are known in the vernacular of its *habitat* by the name of *kosu* or *kosam*. It may be remembered that several years ago the scientist Roger discovered a bacilus which was held to be the cause of dysentery. In experiments which he conducted upon animals, Dr. Mougeot found that, wherever these bacteria were most numerous in the bowels, the use of the *kosu* seed, which, by the way, is about a centimetre in length and lies hidden within a small oily kernel, led to their utter destruction. He usually administered from six to ten seeds on the first day and twelve on the second, in which time a change for the better generally became apparent. Dr. Mougeot claims that 871 out of 879 cases experimented upon proved successful.—*Pioneer*, June 2.

ROYAL COLONIAL TOUR.
TEA CULTIVATION IN CEYLON.

(*From Our Special Correspondent.*)

H. M. S. ST. GEORGE, Singapore, April 22.

It is one of the penalties of a visit to Ceylon that a great feeling of regret arises when the day of departure arrives, tempered, it is true, by the hope that in the future one's eyes may again rest on a land so fair and beautiful. One of the leading residents of the island remarked recently, at some function, "that it is the opinion of the present Governor, Sir J. West Ridgeway, and of the leading Colonists and officials, that Ceylon only needs to be better and more widely known to be still more appreciated." This is a true sentiment, and the Royal visit should do much to enhance the popularity of the most prosperous of the Crown Colonies. It possesses features that should attract all. As the island is today, those travelling for pleasure will find much to gratify their tastes in the rich and glorious scenery, the simple, quiet, and inoffensive habits of the native races, and in the hill districts a climate which has the reputation of being one of the most enjoyable in the world. To the student of book-lore there is no lack of opportunity for interesting research. The several races which now form the native population have woven in the past a fascinating record in which many of the blackest spots are, it is sad to say, due to the presence of unscrupulous European adventurers. In the wonderful ruins, which the archæologist delights to unearth for his own instruction and that of mankind, are signs that in the earlier days of the world Ceylon was inhabited by a noble race, of high intelligence and capabilities.

The point of prosperity to which the island of Ceylon has attained at the commencement

OF THE 20TH CENTURY

is the more remarkable and praiseworthy since less than twenty years ago it was nigh sick unto death through a trade disease, brought about by the failure of the coffee berry in 1874, from which, thanks to the dauntless spirit and enterprise of the planters, whose salvation came with the planting of the tea-shrub, a recovery so rapid and marvellous has been made. It is true that the tea plant was first introduced into Ceylon as early as 1842, when a field was laid out in the Ramboda Pass, but no serious attempt at its cultivation was made till the collapse of coffee gave it the opening wanted. Happily, in this hour of tribulation, the planters did not despair. Like men they put their backs to the wheel, and shoved hard, until once more the cart of their fortunes no longer travelled brake-less down the road of ruin. A brilliant and most accomplished Governor, Sir Arthur Gordon, afterwards Lord Stanmore, was there to aid their efforts, and until the cultivation of tea came to maturity the evil years were tided over by the cultivation of cinchona, a tree from whose bark is produced the febrifuge, quinine. Its rise and fall forms a short chapter in the agricultural history of Ceylon, but it bridged over the most disastrous period.

The development of

TEA CULTIVATION

has been marvellous. Wherein, then, lies the secret of the marvellous diversion of a staple trade from an old-established centre to new and younger rivals, who, moreover, were handicapped in their dealings, owing to the artificial rise in the value of the rupee, due to legislation, which operated to the disadvantage of the Indian and Ceylon planter in competition with the Chinese manufacturer? The secret will be found in the value, purity, and cleanliness of the tea manufactured under European supervision, and scientifically prepared by machinery, as compared with the primitive methods of Chinese hand labour. It is said by those speaking with knowledge that, if people at home knew how the China tea was prepared for the market, they would never drink it again. It is not my intention to enter into any detailed description of tea-growing and manufacture. Although passing a few estates, the journey to Kandy only takes the traveller to the border of the tea country, which lies more or less in a semi-circle running north and south to the east of this town; but as many of those with whom we came in contact during our stay were connected with the industry, it is obvious that with such an interesting subject for discussion our knowledge of tea cultivation was materially increased.

Of Colombo our glimpse was too brief to convey more than a pleasurable impression. It contains many modern and handsome buildings, and, further, possesses the reputation of having several of the best hotel in the East.

Although I fear I have written at too considerable length, for which the interest of my subject can be my only excuse, mention must be made of the

FAMOUS BOTANICAL GARDENS

at Peradeniya, some four miles from Kandy. Here, in a large space of 150 acres, most carefully laid out, and with its well-trimmed turf recalling at times the precincts of an English park land, is stored a marvellous wealth of tropical vegetation, such as is, perhaps, to be found in no other spot on earth. The utmost care is lavished on the growth and cultivation of the plants, with the result that one may wander for hours through avenues of stately beauty. Scientific instruction has not been allowed to overrule picturesque effect, and the feelings of the visitor are in a manner largely reflected by the remark of one who said his taste for an English hothouse had been absolutely spoilt by the view of this wonderful garden. Perhaps, in the midst of all the marvels of the earth's raiment none is more remarkable than the Talipot palm. The screw pine, the banyan tree, with its weird roots crawling like pythons over the ground, clumps of bamboos, which soar with tufted feathery crests a hundred feet or more above ground, and many others are all beautiful, but the Talipot palm outdoes them all. In its early growth for the first ten years it spreads out great fan-shaped leaves, and then the trunk begins to form. The natives compute the uses to which the tree can be put as 801, of which the foremost are a rain-cloak and a sunshade. Some of the leaves will shade or keep dry twenty men: three or four make an excellent tent. Like the papyrus of the ancients, the Talipot leaves when boiled and dried are used for writing under the native term of ola. On strips of ola historical records and religious codes have been handed down from time immemorial. There exist manuscripts 2,000 years old in a perfect state of preservation, with the Pali characters as clear and distinct as when

first graven. When the palm approaches full maturity, it develops a great bud, which in due course bursts with a report, and lovely white blossoms unfold and spread in a pyramid shape of creamy flowers. But like the swan's song, the flowering of the Talipot announces its doom. Within a year it has drooped and dried.—*Daily Telegraph*, May 22.

MR. THOMAS CHRISTY OF LONDON ON HIS TRAVELS.

SOAP-MAKING AND COCONUT OIL: A NEW PATENT.

IMPROVED ORANGE CULTURE FOR EGYPT—WHY NOT FOR CEYLON?

There are few more enterprising, inventive or interesting men of business in the City of London than Mr. Thomas Christy, the head of the well-known drugs and new plants and products' importing house, the inventor of the Rubber-separating machine, and of many more useful little articles, and the first to utilise several new plants for medicinal, art or industrial purposes. We have just received two chatty letters from him, telling of a recent visit to Egypt where the temperature was so unusually cold that many of his old China friends on board the steamer pressed him to go on to Ceylon; but he could not spare the time. We venture to quote the purport of his letter regarding Egypt, dated 14th May :—

"While in Egypt I carried on my researches in that wonderfnl conntry, and I think, from what I can see, that it will come out one of the richest countries connected with England,—the people are so hard-working and they use their brains to arrive at a result. I take advantage of the present note to ask if you can help me in a matter. I believe that there are oil mills in certain parts of Ceylon; I want to know what class of oil they press, and if they turn any of it into soap; further, if the manufacture of soap direct from the oil would be a matter worth following up for Ceylon. The reason of my troubling you is that in Egypt some of the soap-makers complained that they were not successful in working the cotton-seed oil. I promised them that I wonld at once look into the matter, and I conferred with chemists in this country who have worked at it, and I believe we have hit off a very inexpensive process. If it works well in Egypt it will also be applicable for Ceylon.

"ORANGES.—I worked considerably at this, and was interested to find out why the oranges were so degenerating and becoming fnll of core and pips instead of being fine, large, juicy oranges. I learned that the natives were grafting plants yielding the red or blood orange on to grafts from their own varieties of oranges. This resnlted in an orange that looks very well on the barrow or in the shop windows, and keeps its color for some length of time, but the natives will not allow the oranges to properly ripen; this is a very bad featnre. The first-class orange that we know of in this country, and which stands the journey well from California, is the Waval Orange, and I have written to my friends in Egypt to try and secure plants and cuttings of these, and do away with the dry-cored, hard orange withont juice. While on this qnestion of the red or blood orange, I may say that with the assistance of Admiral Blomfield I threshed out this subject. The old idea was that the pomegranate pollen, impregnating that of the orange, caused the blood red color. This is a botanical impossibility, so I don't go into that matter further; but I learned that it is the red pomelo which is found in the island of Labnan, and which is a species of orange; these pomelos were sent to Amoy and as Malta is supposed to be the origin of the red Maltese Blood Oranges, I was cnrions to find out how it was that this occurred. I learned that the Jesuits had sent the pomelo and orange trees home to Europe and they had sent them to Malta; hence the idea of the Malta blood orange being nnique, whereas this red orange is now to be found all along the shores of the Mediterranean and in many instances has greatly deteriorated the frnit and it has also been largely sent to Egypt. People often express their disappointment when they see on a barrow or in a shop, especially abroad, a fine orange, very black in the centre, and on secnring some from the same pile find that they are not nearly so red as the decoys put outside. I learned in Egypt that these decoys are produced by allowing the orange to thoroughly ripen on the tree, when it takes up a much deeper shade of color. Further, if it is desired to increase the size and the depth of color they manure the tree heavily. This will give them a good yield of large (decoy) fruit.

"I was enabled to secure some very fine oranges in Egypt. One of the dealers packed me a large basket, and when I went on board the steamer I handed it over to the second steward, who put it in the cool room. These oranges arrived in England in perfect condition and were very much appreciated for their fine flavour. I do not know if it has occurred to any of your merchants in Ceylon to purchase oranges at a low price and try shipping them in cold chambers to London. The Navel orange sells in the shops here for 3d, 4d, and 5d each, and there is a great demand for them.

"In Egypt the orange is being cnltivated to an extent that is almost incredible; gardens of 300 to 400 acres each are not nncommon, and already the landed proprietors are seeking to get into connection with steamship owners to follow the example of the Jamaica firms of shipping their fruit to England, but in Egypt they have another great advantage, and that is that the country produces the most magnificent vegetables.

Alas! that Ceylon should be so far behind with its fruit cultivation, and that of oranges in particular; but Mr. Christy's letter affords encouragement to any planters who have gone in for Mr. Pearson's offer to supply reliable kinds, and we trust to hear of improvement and success in culture. Meantime, why should not a Rangala, Hewaheta or Maturata planter try a case of his oranges—such as they are—to the London market. Sent in the cold room, they should arrive in good order and possibly to a good market.

As regards coconut-oil and soap-making in Ceylon we have no very encouraging story to relate; but first let us hear what Mr. Christy has to tell us in a second letter, dated 17th May :—

"I send you by sample post a specimen of soap made in five minutes from coconnt oil. I thonght it wonld interest you to have a specimen that you conld show, because it probably will become a valuable process, especially in conntries where oil exists in quantities but yet is difficult of transport. I may say that the process is very inexpensive and most simple and it is done without heat. My friend, the chemist, labels it "process almost instantaneons," but I put it down at 5 minutes. Use it in any way and pnt it to any test you like; I can easily send yon more at any time. I send yon copy of the letter with sample that I received this morning."

(From the Chemist to Mr. Christy.)

"By this post I am sending yon a sample of pnre coconut oil *saponified* by my *rapid* cold *process*. Nothing beyond very ordinary mixing arrangements are re-

quired for the purpose. It would remain sufficiently liquid to allow of being run into barrels or boxes, and it would quickly set as hard as a rock. The packages need not be expensive, as no ordinary atmospheric temperature would re-melt it. This appears to me the best way of packing this product, as in the raw condition the loss is enormous. Of course in this condition it would only be suitable for the soap-makers. But this trade uses the bulk of the production and in addition to the saving in waste they would have the advantage of having a ready-made soap which only requires mixing."

The specimen of soap sent to us is rather crude, and we fancy the article that used to be manfactured at the Hultsdorf local coconut oil mills was much superior. In 1890 we exported 660 cwt of local manufacture, chiefly to Mauritius: but all this manufacture and trade has died away; and we import now over R220,000 (£15,000) worth of soap each year, although we suppose more coconut oil is shipped from Colombo than from any other port in the world.

CITRONELLA AND LEMON-GRASS OIL.

From the Semi-Annual Report of Messrs. Schimmel & Co. (Fritzsche Brothers), Miltitz, near Leipzig, London and New York, April-May, 1901, we quote some paragraphs of local interest :—

CINNAMON OIL, CEYLON.—In consequence of insufficient demand, it has at last been decided at Colombo to reduce the price of larger parcels of fine chips. The reason why the sellers of these chips have given way is no doubt partly due to the favourable prices which they have recently obtained for the cinnamon quill shipments.

CITRONELLA OIL.—The value of this important perfume has, during the last six months, undergone a further decline to about 9½d per lb., at which figure it has now stood for three or four months. All reports agree that a further reduction is impossible. It is much more probable that there will be a decided rise: for it is stated in authoritative quarters that, owing to the unprofitable prices, the cultivation of citronella grass has been entirely given up on many large plantations in the Akuressa and Baddegama districts, and has been superseded by tea plantations which yield much more profitable results. Our correspondent estimates the falling-off in the production at at least 25 per cent. If this estimate comes true, which we do not doubt, the reduced production would probably soon affect the quotations. In spite of the low price, this article is constantly being adulterated in a most unheard-of manner. To the usual method of adulteration with kerosene has now been added that with camphor oil; in fact, no other article gives so much work to our analytical laboratory. In what condition should we be, if there were no means of checking the quality! The fine Java quality, specially distilled for us, is more and more appreciated, and is also purchased by many practical experts, who are well able to estimate a thing at its proper value. The yield of this quality is enormous, the perfume exquisite. For fine honey soaps only this oil should be used. We received recently several very interesting photographs of plantations and distilling installations supplying this oil, and hope to reproduce them, for the benefit of our readers, in our next Report.

LEMONGRASS OIL.—The value of this article has risen during the last few months to 4½d per ounce, which would be about equal to a quotation of 11 marks. Whereas the annual export from Cochin usually comes to between 2000 and 3000 cases, the export in 1900 only amounted to 1600 cases, a quantity which is decidedly too small for the present consumption, since the manufacture of citral has placed this article in a totally different position. A return to the previous values is not to be relied upon. The opportune importation of large quantities has placed us in a position to accept orders below the present quotations.

VARIORUM.

RAFIA FIBRE IN MADAGASCAR.—Rofia, or as it is generally spelt, "rafia," is the Malagasy name of a Palm which furnishes a staple article of commerce, called rafia fibre. It is indigenous to Madagascar, and it is to be met with everywhere on the coasts, needing neither cultivation nor attention of any kind. It is not a stately Palm, but sends its enormous branches from near the ground; in a fine specimen one branch is almost a tree in itself. The rib on each branch is as much as 20 feet long, of a pearly grey colour, smooth and shiny, flat on the inner surface, but otherwise round, without any knobs, and so exceedingly hard. At the base it is as large as an ordinary champagne-bottle and tapers to a point at the top. The inside consists of a light pith, which can be split into layers of any thickness. Possibly, says the United States Consul at Tamatave, it is this or an analogous production, which is used for making pith helmets in the East. Naturally these ribs combine great strength with wonderful lightness and are used for shafts for "filanjanas" or palanquins, ladders or other purposes, but otherwise have no particular commercial value. It is the pinnate leaves which produce the rafia fibre of commerce. One Palm frond will produce eighty or one hundred long green leaflets, from 2 to 5 feet in length, like the leaves of the Sugar-cane, but of a dark, lustrous green, and both thicker and stiffer. These again contain a round and pliant rib, which the natives utilise for making baskets and dredges for catching small fish and shrimps in the rivers after they have stripped off the green part which furnishes the fibre. The under part of this green leaf (which is not exposed to the light, as it remains folded), is of a pale greenish-yellow colour, and from that side the inner skin can be peeled off in the same manner as the skin on the outside of a Pea-pod, except that it peels off straight to the tip without breaking. It is then of the palest green, and after being dried in the sun assumes a light straw colour. This is the rafia fibre of commerce. It was originally sought for by the natives for use in articles of clothing. The men bring in the fronds, and women and girls weave it on hand-looms, of any coarseness or fineness. Woven just as it is peeled off from the fronds, it forms a kind of sacking used for wrapping goods, while the perfection of the art, as known by the Hovas only, is to weave a tissue of which the warp is rafia fibre split very fine, and the weft of white silk. This gives an article called silk lamba, which fetches fancy prices in Europe and America. The coast tribes use it for clothing, but of moderate fineness, with dyed stripes of indigo, saffron, black, and a dirty green. It is a cold, comfortless-looking material, and refuses to adapt itself to any folds that a sculptor would care to copy. Rafia fibre is used in Madagascar by nurserymen, gardeners, &c., for tying up vines and flowers, and possibly for grafting. It possesses the advantage of being as soft as silk, and is not affected by moisture or change of temperature so as to risk cutting or wounding the most delicate tendrils, and it does not break or ravel when folded or knotted. These qualities bring it into use all over Europe, and consequently maintain its price. It is

virtually inexhaustible in Madagascar, the supply being limited only by the scarcity of labour. For export the fibre is merely collected in large skeins, twisted up or plaited, and then baled like raw cotton, Madagascar exports about 20,000 bales annually.—*Journal of the Society of Arts.*

THE MANUFACTURE OF COCONUT BUTTER IN GERMANY.

The manufacture of cononut butter is an industry of some importance in the City of Mannheim. The Mannheim factory is said to be the only one of any considerable size in Germany ; it has an output of about 10 tons of butter a day. The product is sold under the name of "Palmin"—a registered trade name —or coconut butter ("Kokosnuss butter"). It is manufactured from the kernels of coconuts, and is used as a substitute for butter and lard in cooking. Consul Harris of Mannheim says that, as sold, it is generally white in colour, almost tasteless, melts at about 80° Fahr., and is of about the consistency of mutton or beef tallow. When desired by retail customers who are bakers, confectioners, &c., the product is coloured to resemble ordinary butter: When furnished to dealers it is unlawful to colour it. The proprietors of the factory at Mannheim, referred to above, claim that an analysis of their product shows it to contain more than 90 per cent. of vegetable fat, with but a slight trace of water, while ordinary butter contains about 85 per cent. of fat and nearly 15 per cent. of water. It is stated that the substance does not become rancid easily, that it will keep for three or four months in a cool room, and that it is much more wholesome and easily digested than the ordinary fats used for baking and cooking. For this reason the product has met with considerable favour in German hospitals and other institutions, and for use in army camps. Coconut butter is generally put up in square packages, wrapped in parchment paper, a small percentage being sold in tin cans. The latter are hermetically sealed for shipment during hot weather. The product is sold at one price throughout Germany, namely, about eight-pence per pound, or about half the price of ordinary butter. The kernel of the coconut is imported in thoroughly dried strips, forming the "copra" of commerce. It is subjected to various refining processes, by which all the free acids and other substances are separated, leaving only the vegetable fat. In the latter stages of the manufacture the product resembles ordinary butter recently churned. It is placed in machines, similar to the separators used in creameries, in which the water and other foreign substances are separated by centrifugal force. In the manufacture of coconut butter a by-product, consisting of free acids and other substances, is obtained, and sold to soap manufacturers.—*Journal of the Society of Arts,* May 24.

RUBBER NOTES.

Experiments in the cultivation of the ficus elastica at Katha, in Upper Burmah, have not been very successful, only eighty-two out of 370 seedlings planted survived at the end of the past year. It is stated that the Rubber Trade in the Lagos district has almost reached a position of complete standstill. This anxiety is well founded, and there are some substantial reasons for believing that other causes than the failure of the rubber trees are operating, to obstruct and kill the trade.—*India Rubber Journal,* May 13.

SEYCHELLES NOTES.

VANILLA.—Our next year's vanilla crop promises to be a very good one. The rains in November, however, prevented it being the bumper crop it then appeared to promise. The owners of the mountain-vanilla estates were the heaviest losers, owing to the rain. It came down steadily just a day or two before the great flowering days, the result being that thousands of flowers were not fecundated. The area under vanilla in the Colony is steadily increasing. There are a good many diseased vines about all over the islands, but now, owing to each vine being kept distinctly separate from its neighbour, the fell vanilla-disease cannot cause the ruin of our plantations as it did in 1889 and following years.

SOAP.—The exports of soap from the Seychelles per the British India steamers to Zanzibar and the East Coast of Africa continue to expand. Consequently caustic soda is being imported here in increasing quantities. The bulk of it comes from Newcastle-on-Tyne. One of the chief causes of the flourishing state of our soap industry is the low price at which coconut oil has been selling. This oil is only worth now about 1·60 r per velt (1½ gal.), instead of over 2r a year or two ago.

GUANO.—The exports of so-called "guano" from the Admirantes Islands (a dependency of Sychelles) are also increasing. Shiploads have been sent recently from Remire Island to Durban and Mauritius. As I think I already told you, this stuff is only rich in phosphates, but it is an excellent material to use as a basis with which to mix other kinds of fertilisers.—A Seychelles *Cor.* to the *Chemist and Druggist* or May 11.

THE TRADE ON TEA:

(To the Editor, Grocers' Journal.)

SIR,—In your capital leading article on "The Trade in Tea," in last week's *Grocers' Journal,* you say that tea is still, as it always has been, the chief glory of a grocer's business. This is certainly what it ought to be, but I must confess that it is difficult to see where the glory comes in. Selling a strong, dark, bitter, dyspeptic Assam, with a little tasteless unfreshing Ceylon thrown into the blend, and perhaps some uncommonly common China (not to improve the flavour but to make a little more profit), in possibly a very handsomely decorated canister, at an impossible price, does not, in my opinion, add largely to the glory of the tea trade. Neither is it likely to assist the public to value or enjoy the infusion. It is true there is "nothing like tea" when you get fine China tea properly made, and I have proved over and over again that ninety-five people out of a hundred appreciate such tea, which refreshes them more than cocoa or chocolate, and is palatable without milk and sugar. This is more than can be said of common Indian tea, which is not only injurious to health and temperance, but is decidedly nasty. I agree with you that China tea has long been under a cloud. This has been brought about through the trade, as a body, shirking the trouble of selecting China tea when they got strong liquoring Assams at low prices. These latter produced a dark-coloured liquor, and were puffed as more economical than China at the same price ; and it was asserted that three-quarters of a pound made as much liquor as a pound of China at the same price. Old-fashioned people who knew anything about tea were not gulled by this specious argument, and did not give up drinking pure China tea ; but gradually it became more and more troublesome to get a pound of tea anywhere that was not heavily dosed with Assam, which ultimately swamped all the old flavour of China tea out of the blend, and then the trade (all but a few old houses) bought and sold nothing but a mixture of Indian and Ceylon, to save trouble and secure a profit. At the present time it is almost impossible to find a grocer who has a pound of really fine China tea in stock, and equally impossible to find a customer who has any knowledge of the quality he gets for his money. Whisky and tobacco have not improved the public palate, or the teas now supplied by the bulk of the trade would

command a very limited sale. I again agree with your remark about the complaint "I can't drink tea" being so common now, but this mostly comes from people over forty, who are wise enough not to swallow a tea that would give them dyspepsia, or from the young who have not tasted a really enjoyable cup of choice China tea, and are quite disgusted with the bitter burnt flavour of cheap Indian tea.—I am, yours, etc., CINQUE PORTS.

Boswell House, Bolt Court, E. C., May 20, 1901.
—*Grocers' Journal*, May 25.

CINCHONA IN JAVA AND PROSPECTS.

The condition of cinchona cultivation in Java is not altogether that of an open book, at least so far as knowledge in the London market is concerned, for it is a prey to all sorts of rumours, especially as to cultivation being on the decline. We have during the past ten days had the opportunity of getting authentic information on the matter from two gentlemen who are not primarily interested in cinchona production. One resided in Java for nearly ten years, following a scientific pursuit, and the other spent nearly two months in the island investigating the cinchona question. Both agree that cinchona cultivation is on the up grade in Java, and that the cultivation of ledger trees there may be said to be in its infancy. Everything is giving way to ledger trees, which are all planted as graftings upon succirubra seedlings. These compound plants flourish exceedingly in the well-cultivated soil, which is kept as clean as any Surrey market-garden. There is no sign of any plantations going out of cultivation; rather the contrary, as the whole tendency is to get bark of high quinine percentage. Much interest is taken by the planters in the Bandong Quinine-factory, and, as the planters can with advantage get their highest-yielding barks worked up there, they do not export the best barks. The factory is now the only one in Java, and it is slowly making its influence felt on the market. Last year it sold 900,000 oz. of quinine by auction locally, the bulk of it going to the United States. We may note that the exports of quinine from Germany to the United States decreased 1,000,000 oz. last year. It has often been asserted that the Java planters have the quinine situation in their own hands, if they would come to some agreement to restrict the output or control the supply of bark. This is just what they cannot, or will not, do. On the contrary, they ship larger quantities every season. For instance, the shipments for 1898-1900 have averaged over 11,000,000 Amsterdam lb. perannum, against an average of 9,000,000 for 1895-1897. During the first four months of this year the shipments also show the large increase of nearly 1,000,000 Amsterdam lb. To this fact, taken together with the heavy London stock of quinine, is attributed the recent depression of the market and want of confidence among speculators. During this week there has been a slight revival, but it is thought to be merely a "move" with the idea of giving a fillip to the bark auctions at Amsterdam at which the quantity offered is again large, representing nearly 1,080,000 oz. quinine in the bark, or over 30 tons. The result of these auctions will be found in our Trade Report, and will be eagerly awaited by quinine speculators and dealers generally, for upon it depends the immediate course of the quinine market. According to the drug statistics there was a stock of 3,330,000 oz of quinine in the London warehouses at the end of April, and, although this is slightly less than the stock at the corresponding period of 1900, it has none the less disheartened speculators. The deliveries for April were only 37,000 oz., while the imports reached the respectable total of 218,480 oz. The above stock is a heavy one, and the figures since the beginning of the year, month by month, show that it is normal in recent history:—

	1901	1900
	oz.	oz.
January	3,300,000	2,800,000
February	3,100,000	3,090,000
March	3,150,000	3,320,000
April	3,330,000	3,430,000

We may repeat, in regard to the heavy shipments of cinchona from Java, that they are not a matter of uprooting trees or anything of that kind, but are simply the natural outcome of a culture which is carried on with excessively cheap native labour, and under the best possible scientific conditions. There is no evidence, as far as we can gather, that this is done at a loss to the planters, and they are not in the slightest interested in what will suit quinine speculators.—*Chemist and Druggist*, May 11th.

PLANTING NOTES.

PISCICULTURE.—We are obliged to Mr. Farr for his suggestive note on this subject, To improve the fish supply of the island, to stock our large rivers, tanks, and lakes with new and suitable species, is a matter of as much importance to the Colony at large, in its own proportion, as to spend large sums on "irrigation" or "railways." Let our Legislative Councillors bestir themselves.

A NEW LOBELIA.—Mr W V Fitzgerald has published in the *West Australian* a description of a new species of lobelia, named *L Gouldii*, after Mr L H L Gould, of Mt. Malcolm, who forwarded the specimens from which the species is determined. It flowers profusely late in September, forms large patches in ferruginous, gravelly, or sandy soil, and would be of horticultural value where a bedding-plant of violet colour was required. It is a little plant, two inches to four inches high, with large violet flowers, singly terminating in large branch-like peduncles. The corolla is three-quarters of an inch to nearly one inch long.—*Chemist and Druggist.*

TOMATOES ARE MOST HELPFUL TO THE SYSTEM—when eaten raw, as the volatile oil they contain is dissipated by the heat of cooking. Green vegetables, such as spinach and cabbage, are invaluable as medical articles of diet, as they possess blood-purifying properties and act indirectly on the liver. Turnips, are nutritious, while the young turnip-tops are possessed of tonic properties. Parsley is a blood purifier, and should be eaten both raw and cooked. An almost exclusive diet of fruit and vegetables is supposed to induce purity of complexion.—*Indian Agriculturist*, June 1.

THE CULTIVATION OF TEA IN NATAL.—Some ten years since we gave a few figures respecting the growth of Tea in Natal, supplied by the head of the Aricultural Department. At that time it was thought that a good market could be found in this country and at the Cape for all that could be spared after satisfying the needs of the proprietors of the Tea plantation. Progress has certainly been made, but not by leaps and bounds. The estimate for the supply of 1901 is $1\frac{1}{2}$ million of pounds, or an increase over the production of last year of 250,000 lbs.—*Gardeners' Chronicle*, May 25.

SHARE LIST.

ISSUED BY THE

COLOMBO SHARE BROKERS' ASSOCIATION.

CEYLON PRODUCE COMPANIES.

Company	paid p. sh.	Buyers.	Sellers.	Transactions
Agra Ouvah Estates Co., Ltd.	500	—	900	...
Ceylon Tea and Coconut Estates	500	—	—	...
Castlereagh Tea Co., Ltd.	100	..	..	70
Ceylon Provincial Estates Co. Ltd.	500	490	500	..
Claremont Estates Co., Ltd.	100	—	—	—
Clunes Tea Co., Ltd.	100	—	75	—
Clyde Estates Co., Ltd.	100	...	—	—
Doomoo Tea Co., of Ceylon Ltd.	100	60	..	—
Drayton Estate Co., Ltd.	100	...	...	...
Eila Tea Co., of Ceylon, Ltd.	100	..	40	...
Estates Co., of Uva, Ltd.	500	-	250	—
Gangawatta	500	—	—	..
Glasgow Estate Co., Ltd.	500	—	940	—
Great Western Tea Co., Ltd.	500	600	—	—
Hapugahalande Tea Estate Co.	200	—	—	..
High Forests Estates Co., Ltd	500	...	550	—
Do part paid	400	—	450	—
Horekelley Estates Co., Ltd.	100	65	..	—
Kalutara Co., Ltd.	500	—	250	—
Kandyan Hills Co., Ltd.	100	—	40	—
Kanapediwatte Ltd.	100	—	85	—
Kelani Tea Garden Co., Ltd.	100	—	—	—
Kirklees Estates Co., Ltd.	100	—	120	...
Knavesmire Estates Co., Ltd.	100	—	60	—
Maha Uva Estates Co., Ltd	500	—	400	—
Mocha Tea Co., of Ceylon, Ltd.	500	—	..	...
Nahavilla Estate Co., Ltd.	500	—	300	—
Neboda Tea., Co. Ltd	500	..	500	—
Nyassaland Coffee Co. Ltd	100	—	—	..
Ottery Estates Co., Ltd	100	—	—	—
Palmerston Tea Co., Ltd.	500	...	400	—
Penrhos Estates Co., Ltd.	100	—	100	—
Pitakanda Tea Company	500	—	—	
Pine Hill Estate Co., Ltd.	60	—	37·50	—
Putupaula Tea Co., Ltd.	100	—	—	..
Ratwatte Cocoa Co., Ltd.	500	—	250	—
Rayigam Tea Co. Ltd.	100	—	40	...
Roeberry Tea Co., Ltd.	100	50	...	..
Ruanwella Tea Co., Ltd.	100	—	30	—
St. Helier's Tea Co., Ltd.	500	—	500	...
Talgaswela Tea Co., Ltd.	100	—	35	...
Do 7 per cent Prefs.	100	..	70	..
Tonacombe Estate Co., Ltd.	500	..	325	...
Udabage Estate Co., Ltd.	100	...	...	..
Udugama Tea & Timber Co., Ltd.	50	..	..	..
Union Estate Co., Ltd.	500	...	200	...
Upper Maskeliya Estates Co. Ltd.	500	—	450	—
Uvakellie Tea Co., of Ceylon, Ltd.	100	55	..	—
Vogan Tea Co., Ltd.	100	...	50	—
WanarajahTea Co.,Ltd.	500	..	—	—
Yataderiya Tea Co., Ltd.	100	—	300	—

CEYLON COMMERCIAL COMPANIES.

Company	paid p. sh.	Buyers.	Sellers.	Transactions
Adam's Peak Hotel Co., Ltd.	100	20	30	..
Bristol Hotel Co., Ltd.	100	..	...	125
Do 7 per cent Debts	100	105	—	—
Ceylon Gen. Steam Navgtn. Co., Ltd.	100	200	225	..
Colombo Apothecaries' Co. Ltd.	100	137½	...	...
Colombo Assembly Rooms Co., Ltd.	20	15	..	...
Do prefs.	20	...	..	—
Colombo Fort Land and Building Co., Ltd.	100	75	85	..
Colombo Hotels Company	100	292·50	—	—
Galle Face Hotel Co., Ltd.	100	152·50	...	152·50
Kandy Hotels Co., Ltd.	100	...	122·50	..
Mount Lavinia Hotel Co., Ltd.	500	...	..	...
New Colombo Ice Co., Ltd.	100	...	200	—
Nuwara Eliya Hotels Co., Ltd.	30	22·50	...	—
Do 7 per cent prefs.	100	100	...	..
Public Hall Co., Ltd.	20	12½	14	—

LONDON COMPANIES.*

Company	paid p. sh.	Buyers.	Sellers.	Transaction
Alliance Tea Co., of Ceylon, Ltd.	10	...	8¾—9¼	..
Anglo-Ceylon General Estates Co.	100	..	35—45	..
Associated Estates Co., of Ceylon	10	—	1½—2½	...
Do. 6 per cent prefs.	10	..	4—6	..
Ceylon Proprietary Co.	1	...	⅜—⅝	..
Ceylon Tea Plantation Co., Ltd.	10	..	24—25	..
Dimbula Valley Co., Ltd.	5	..	5¾—6	..
Do prefs.	5	..	5½ - 6	...
Eastern Produce & Estates Co. Ltd.	5	...	4½—5	..
Ederapolla Tea Co., Ltd.	10	...	7—10	...
Imperial Tea Estates Co., Ltd.	10	...	4½—5½	..
Kelani Valley Tea Asscn., Ltd.	5	..	5—6	...
Kintyre Estates Co., Ltd.	10	...	6—8	..
Lanka Plantation Co., Ltd.	10	..	4—5	..
Nahalma Estates Co ,Ltd.	1	—	nom	..
New Dimbula Co., Ltd.	1	...	2¾—3	..
Nuwara Eliya Tea Estate Co., Ld.	10	9¾	..	...
Ouvah Coffee Co., Ltd.	10	..	6—7	...
Ragalla Tea Estates Co., Ltd.	10	..	9—10	..
Scottish Ceylon Tea Co.,Ltd.	10	—	13—15	...
Spring Valley Tea Co., Ltd.	10	...	2½—3½	..
Standard Tea Co., Ltd.	6	10½	—	...
The Shell Transport and Trading Company, Ltd.	1	..	2⅞—3⅛	..
Ukuwella Estates Co., Ltd.	25	—	par	...
Vatiyantota Ceylon Tea Co., Ltd.	10	...	6½—7½	...
Do. pref. 6 o/o	10	..	10—10½	..

BY ORDER OF THE COMMITTEE.

Colombo, June 28th, 1901.

* Latest London Prices.

RAINFALL RETURN FOR COLOMBO.

(*Supplied by the Surveyor-General.*)

	1896.	1897.	1898.	1899.	1900	Av of 31yrs.	1901
	Inch	Inch	Inch	Inch.	Inch.	Inch.	Inch*
January ..	2·92	3·81	2·32	6·98	3·72	3·24	11·91
February ..	0·35	1·68	1·98	2·78	0·63	1·89	3·55
March ..	5·64	3·66	4·21	0·88	3·71	4·75	5 12
April ..	5·93	10·97	22·81	6·66	15·12	11·43	8·71
May ..	9·31	8·30	5·80	17·73	10·63	12·04	6·28
June ..	8·37	10·14	10·94	9·23	7·83	8·35	5·90*
July	2·85	5·24	6·15	1·11	6·77	4·30	
August ..	6·35	9·09	0·97	0·62	7·35	3·79	
September	10·99	4·58	6·90	1·48	4·00	4·98	
October ..	16·78	4·71	20·60	12 99	9·47	14·36	
November..	19.81	11·66	17·38	8·58	9·25	12·55	
December..	11·76	8·89	3·05	4·44	5·20	6·35	
Total..	101·06	82·73	103·11	73·48	83·68	88·03	41·47

* From 1st to 26th June 4·36 inches, that is up to 9-30 a.m on the 27th June —ED. *C.O.*

BRICKS FROM SLAG.

The problem of what to do with slag seems to have been solved by the George-Marien Mining and Smelting Company, at Osnabruck, where the granulated slag from blast furnaces is mixed with slag cement in the proportion of one part of slag to eight parts of cement, and the mixture is compressed into bricks weighing 7½ lb. After two or three months' exposure to the air these bricks are suitable for building purposes. Whilst they are newly made they can be cut to any shape desired, and their rough surface facilitates their use with a minimum of mortar. These bricks will sustain a pressure of 1,500 lb per square inch, and are very suitable for resisting the high temperature of factory chimneys. The slag finely granulated and mixed with cement in the proportions of eleven to one furnishes excellent mortar.—*Sell's Commercial Intelligence.*

TEA IN SICILY.—We learn from *Nature* that an attempt was made to grow the tea bush in Sicily (from Japan plants) so far back as 1872; but not much success attended the cultivation, and, as nothing has been heard of it since, we suppose the trial was abandoned.

COLOMBO PRICE CURRENT.

(Furnished by the Chamber of Commerce.)

EXPORTS.

Colombo, 24th June, 1901.

CARDAMOMS :—
All round parcel, well bleached per lb. R1·45
Do. dull medium do. R1·20
Special assortment, 0 and 1 only do. R1·80
Seeds do. R1·40

CINCHONA BARK :—
Per unit of Sulphate of Quinine 13c—1½ to 3 o/o.

CINNAMON :—
Ordinary assortment per lb. 56c.
Nos. 1 and 2 only per lb. 60c.
Nos. 3 and 4 only per lb. 51c.

CINNAMON CHIPS :—
Per candy of 560 lb R80·00

COCOA :—
Finest estate red; unpicked per cwt R55
Medium do do R52
Bright native, unpicked and undried R49
Ordinary do do R43
} Quotations nominal. Supplies scarce.

COCONUTS—(husked).
Selected per thousand R46·00
Ordinary " R38·00
Smalls " R29·00

COCONUT CAKE—
Poonac in robins f. o. b. per ton R82·50
Do in bags None

COCONUT (Desiccated).
Assorted all grades per lb 16c

COCONUT OIL—
Dealers' Oil per cwt R15·25.
Coconut Oil in ordinary packages f. o. b. per ton R335·00. Business done.

COFFEE.—
Plantation Estate Parchment on the spot per bus.—None.
Plantation Estate Coffee f.o.b. (ready) per cwt.—None.
Native Coffee, f.o.b per cwt.—None.

CITRONELLA OIL—
Ready do per lb.—47c

COPRA—
Boat Copra per candy of 560 lb. R50·00
Calpentyn Copra do do R53·00
Cart do do do R47·00
Estate do do do R52·00

CROTON SEED per cwt—None

EBONY—
Sound per ton at Govt. depot—R190. As per sales of 3rd June.
Inferior R100. As per sales of 3rd June.

FIBRES—
Coconut Bristle No. 1 per cwt R10·50
Do " 2 " None
Do mattress " 1 " 4·00
Do " 2 " 3 00
Coir Yarn, Kogalla " 1 to 8 18·00
Do Colombo " 1 to 8 16·00
Kitool all sizes " None
Palmyrah " None

PEPPER—Black per lb None

PLUMBAGO—
Large lumps per ton R550
Ordinary lumps do 525
Chips do 350
Dust do 225
Do (Flying) 130

SAPANWOOD— per ton None.
SATINWOOD (ordinary) per cubic ft. None.
Do do per cubic ft. None.

TEA—	High Grown Average.	Medium Average.	Low Grown Average.
Broken Pekoe and Broken	cts	cts	cts
Orange Pekoe per lb	59	46	37
Orange Pekoe do	48	36	29
Pekoe do	42	33	24
Pekoe Souchong do	37	26	20
Pekoe Fannings do	33	26	26
Broken mixed—dust, &c	26	25	24

CEYLON EXPORTS AND DISTRIBUTION, FOR SEASONS 1900 AND 1901.

COUNTRIES	Black Tea. 1901 lbs.	Black Tea. 1900 lbs.	Green Tea. lbs.	Coffee—cwt. Plantation	Coffee—cwt. N'tive	Coffee—cwt. Total.	Cocoa cwts.	C'moms lbs.	Cinnamon Bales lbs.	Cinnamon Chips. lbs.	Coconut Oil. 1901 cwt	Coconut Oil. 1900 cwts	Copra cwts.	Desiccated Coconut lb.	Poonac cwts.	Coconuts No.	Plumbago. 1901 cwts.	Plumbago. 1900 cwts.	Fibre. cwts.
To U K. ..	52933152	54461211	93449	2903	..	2903	24303	134656	226322	140871	80118	112747	3288	3339372	570	6247270	69388	48012	30140
,, Austria ..	23750	5902	..	..	..	...	...	..	5000	5600	1178	3038	14242	31201	...	..	...	..	...
,, Belgium ..	8666	2115	...	53	..	53	...	6000	25800	39200	2495	722	30797	216785	28609	136225	6985	19114	11046
,, France ..	144297	108409	...	204	...	204	..	1479	20900	3920	...	..	21215	2240	500	406	186	..	366
, Germany ..	180824	188596	...	3	..	3	1127	11675	150900	231605	903	5443	34808	376365	20828	508220	20205	28941	6651
,, Holland ..	15489	2000	...	...	..	..	...	..	11000	58240	..	...	..	19500	..	..	..	912	569
,, Italy ..	6272	5007	..	..	..	..	..	480	40600	39872	499	..	..	..	...	5242	..	...	...
,, Russia ..	4762133	3497759	...	..	..	...	48	764	...	..	...	..	17123	..	..	..	3474	1004	..
,, Spain ..	...	15130	...	..	...	..	..	..	58300	28000	..	..	3925	10370	..	..	...	..	..
,, Sweden ..	25799	43218	..	...	..	..	..	..	..	11200	199	...	...	6450	..	..	..	105	..
,, Turkey ..	24822	11203	...	...	..	...	..	..	..	...	..	...	...	...	...	...	...	...	..
,, India ..	663397	299505	15093	61	..	61	..	72319	..	.	35909	24802	502	..	...	265900	158	163	19
,, Australia ..	9659322	7583310	...	1467	10	1477	158	...	1800	37900	94	83	..	391382	...	..	132	1637	2197
,, America ..	889100	2517826	307302	46	..	46	960	2781	117100	25437	7007	31479	1	679653	...	..	69183	82728	1013
,, Africa ..	143631	82578	..	..	..	..	..	496	..	..	76	...	..	5208	..	867524	...	...	80
,, China ..	1460743	648802	4450	14	...	14	149	60	15000	..	767	622	..	72[illegible]84	..	..	..	41	..
,, Singapore ..	66873	47882	...	..	..	...	1091	..	7700	..	...	..	...	..	...	...	..	...	166
,, Mauritius ..	15330	700	..	..	..	..	...	..	..	..	..	..	...	..	..	...	..	..	..
,, Malta ..	154933	200203	..	..	...	..	..	..	...	..	..	..	..	...	..	..	.	..	.
Total export from 1st Jan. to 24th June, 1901	71178533	69721356	420294	47.1	10	4761	27836	231734	680422	621845	129185	179836	125901	5150910	50507	8030787	169711	182657	52247

MARKET RATES FOR OLD AND NEW PRODUCTS

(From Lewis & Peat's Fortnightly Price Current, London, June 12th, 1901.)

	QUALITY.	QUOTATIONS.
ALOES, Soecotrine cwt.	Fair to fine dry	44s a 85s
Zanzibar & Hepatic ,,	Common to good	20s a 60s
ARROWROOT (Natal) lb.	Fair to fine	5½d a 6¼d
BEES' WAX, cwt.		
Zanzibar & Bombay White ,,	Good to fine	£6 a £7 10s
Zanzibar & Bombay Yellow ,,	Fair ,,	£6 5s a £6 15s
Madagascar ,,	Dark to good palish	£6 10s a £6 17/6d
CAMPHOR, China ,,	Fair average quality	Nominal
Japan ,,	.. .. ..	15[illegible]s
CARDAMOMS, Malabar lb	Clipped, bold, bright, fine	[illegible]s 3d a 2s 4d
	Middling, stalky & lean	1s 5d a 1s 7d
Ceylon.- Mysore ,,	Fair to fine plump	1s 6d a 4s 3d
	Seeds	1s 11d a 2s 6d
,, Tellicherry ,,	Good to fine	2s 11d a 3s
	Brownish	2s 6d
,, Long ,,	Shelly to good	1s a 2s 9d
,, Mangalore ,,	Med brown to good bold	2s 3d a 3s 3d
CASTOR OIL, Calcutta ,,	1sts and 2nds	4¼d a 4½d
CHILLIES, Zanzibar cwt.	Dull to fine bright	35s a 45s
CINCHONA BARK.- lb. Ceylon	Ledgeriana Orig. Stem	3d a 5½d
	Crown, Renewed	5d a 7d
	Org. Stem	3¾d a 5½d
	Red Org. Stem	3⅜d a 4¼d
	Renewed	3d a 5¾d
	Root	3¾d a 4d
CINNAMON, Ceylon 1sts per lb.	Ordinary to fine quill	10d a 1s 6d
2nds	,, ,,	9d a 1s 5d
3rds	,, ,,	8½d a 1s 4d
4ths	,, ,,	8d a 11d
Chips	,, ,,	[illegible]¾d a 10d
CLOVES, Penang lb.	Dull to fine bright bold	4½d a 9½d
Amboyna ..	Dull to fine	4⅜d a 5½d
Zanzibar and Pemba	Good and fine bright	4d a 4¼d
	Common dull to fair	3¾d a 3⅞d
Stems ..	Fair	1⅝d
COFFEE		
Ceylon Plantation ,,	Bold to fine bold colory	92s 6d a 110s
	Middling to fine mid	70s a 90s
	Low mid. and low grown	
	Smalls	50s a 60s
Native	Good ordinary	30s a 70s
Liberian ,,	Small to fine bold	35s a 40s
COCOA, Ceylon ,,	Bold to fine bold	77s a 94s
	Medium and fair	65s a 77s 6d
	Native	55s a 65s
COLOMBO ROOT ,,	Middling to good	10s a 22s 6d
COIR ROPE, Ceylon ton		nominal
Cochin ,,	Ordinary to fair	£13 10s a £18
FIBRE, Brush ,,	Ord. to fine long straight	£16 a £19
Cochin ,,	Ordinary to good clean	£20 a £24
Stuffing ,,	Common to fine	£7 a £9
COIR YARN, Ceylon ,,	Common to superior	£15 a £30
Cochin ,,	,, ,, very fine	£12 a £32
do. ,,	Roping, fair to good	£10 a £14 10s
CROTON SEEDS, sift. cwt.	Dull to fair	25s a 35s
CUTCH ,,	Fair to fine dry	23s a 35s
GINGER, Bengal, rough ,,	Fair	3[illegible]s
Calicut, Cut A ,,	Good to fine bold	80s a 100s
B & C ,,	Small and medium	40s a 77s 6d
Cochin Rough ,,	Common to fine bold	36s a 41s
	Small and D's	30s a 35s
Japan ,,	Unsplit	33s a 34s
GUM AMMONIACUM ,,	Sm. blocky to fine clean	20s a 45s
ANIMI, Zanzibar ,,	Picked fine pale in sorts	£10 7s 6d a £20
	Part yellow and mixed	£7 15s
	Bean and Pea size ditto	70s a £9 2/6
	Amber and dk. red bold	£5 10s a £7 10s
	Med. & bold glassy sorts	80s a 100s
Madagascar ,,	Fair to good palish ...	£4 8s a £8
	,, ,, red	£4 5s a £9
ARABIC E. I. & Aden ,,	Ordinary to good pale	35s a 58s
Turkey sorts ,,		50s a 75s
Ghatti ,,	Pickings to fine pale ...	12s 6d a 35s
Kurrachee ,,	Good and fine pale ...	52s 6d a 55s
	Reddish to pale selected	30s a 40s
Madras ,,	Dark to fine pale ..	23s a 35s
ASSAFŒTIDA ,,	Clean fr to gd. almonds	60s a 137s 6d
	Ord. stony and blocky	6s a 25s
KINO ,,	Fine bright	1s 6d a 1s 9d
MYRRH, picked ,,	Fair to fine pale	90s a 107s 6d
Aden sorts ,,	Middling to good	50s a 80s
OLIBANUM, drop ,,	Good to fine white	35s 6d a 50s
	Middling to fair	25s a 35s
pickings ,,	Low to good pale	18s a 2[illegible]s
siftings ,,	Slightly foul to fine	16s 6d a 18s
INDIARUBBER, Assam lb	Good to fine	2s 2d a 2s 9d
	Common to foul & mxd.	7d a 1s 6d
Rangoon	Fair to good clean ...	2s a 2s 9d
Borneo	Common to fine	1s a 2s 3d

	QUALITY.	QUOTATION
INDIARUBBER, (*Contd*)		
Java, Sing. & Penang lb.	Foul to good clean ..	8d a 2s 9d
Mozambique ,,	Good to fine Ball ..	2s 6d a 3s 1d
	Ordinary to fair Ball ..	1s 10d a 2s 6d
	Low sandy Ball	1s 3d a 1s 7d
	Sausage, fair to good	[illegible]s 6d a 3s 1d
	Liver and Livery Ball	2s 4d a [illegible]s
Nyassaland	Fair to fine ball	[illegible]s [illegible]d a 3s 11½d
Madagascar ,,	Fr to fine pinky & white	[illegible]s 6d a 2s 9d
	Fair to good black ..	2s a 2s 6d
	Niggers, low to fine .	7d a 2s
INDIGO, E.I.	Bengal--	
	Shipping mid to gd violet	3s 8d a 4s 6d
	Consuming mid. to gd.	3s 3d a 2s 9d
	Ordinary to mid.	[illegible]s a 3s 2d
	Mid. to good Kurpah	2s a 2s 10d
	Low to ordinary	1s 8d a 1s 10d
	Mid. to good Madras	1s 9d a 2s 8d
MACE, Bombay & Penang per lb.	Pale reddish to fine	2s a 3s
	Ordinary to fair	1s 4d a 1s 11d
	Pickings	1s 3d a 1s 4d
MYRABOLANS, cwt	Dark to fine pale UG	5s a 6s
Madras	Fair Coast	5s
Bombay ,,	Jubblepore	4s 3d a 5s 6d
	Bhimlies	4s 3d a 7s 6d
	Rhajpore, &c.	4s 3d a 6s
Bengal ,,	Calcutta	3s 6d a 5s
NUTMEGS— lb.	64's to 57's	2d 1½d a 2s 6d
Bombay & Penang ,,	110's to 65's	1d a 2s 1d
	160's to 130's	6d a 11d
NUTS, ARECA cwt.	Ordinary to fair fresh	14s a 17s
NUX VOMICA, Bombay per cwt.	Ordinary to middling	[illegible]s a 5s 6d
Madras	Fair to good bold fresh	7s a 10s 6d
	Small ordinary and fair	[illegible]s a 6s 9d
OIL OF ANISEED ,,	Fair merchantable	[illegible]s 6d
CASSIA ,,	According to analysis	[illegible]s a 3s 6d
LEMONGRASS ,,	Good flavour & colour	4d
NUTMEG ,,	Dingy to white	1½d a 3d
CINNAMON ,,	Ordinary to fair sweet	3¼d a 1s 6d
CITRONELLE ,,	Bright & good flavour	11d a 1s 0½d
ORCHELLA WEED—cwt		
Ceylon ,,	Mid. to fine not woody..	10s a 12s 6d
Zanzibar ,,	Picked clean flat leaf ...	10s a 16s
	,, wiry Mozambique	10s a 11s
PEPPER (Black) lb.		
Alleppee & Tellicherry	Fair to bold heavy ...	6d a 6⅛d
Singapore	Fair	6 1-16d a 6⅛d
Acheen & W. C. Penang	Dull to fine ...	5¾d a 6⅛d
PLUMBAGO, lump cwt.	Fair to fine bright bold	3[illegible]s a 40s
	Middling to good small	2[illegible]s a 32s
chips	Dull to fine bright ..	10s a 20s
dust	Ordinary to fine bright	[illegible]s 6d a 8s 6d
SAFFLOWER	Good to fine pinky .	65s a 75s
	Inferior to fair .	40s a 60s
SANDAL WOOD—		
Bombay, Logs ton.	Fair to fine flavour ..	£20 a £50
Chips ,,	... ...	5s a £8
Madras, Logs ,,	Fair to good flavour ..	£20 a £50
Chips ,,	Inferior to fine ...	£4 a £8
SAPANWOOD Ceylon ,,	Fair to good ..	£5 a £5 10s
Manila ,,	Rough & rooty to good	£4 10s a £5 15s
Siam ,,	bold smooth	£7
SEEDLAC cwt.	Ord. dusty to gd. soluble	50s a 55s
SENNA, Tinnevelly lb.	Good to fine bold green	5d a 6d
	Fair middling medium	3½d a 4½d
	Common dark and small	½d a 2½d
SHELLS, M. o'PEARL—		
Bombay cwt.	Bold and A's, D's and B's, Small ...	£3 a £4 15s
Mergui ,,	Small to bold ..	£5 12s 6 a £7 10s
Mussel ,,	Small to bold ..	22s a 65s
TAMARINDS, Calcutta...	Mid. to fine bl'k not stony	10s a 11s
per cwt Madras	Stony and inferior ..	7s 6d a 11s
TORTOISESHELL—		
Zanzibar & Bombay lb.	Small to bold dark mottle part heavy	14s 6d a 22s 6d
TURMERIC, Bengal cwt.	Fair ...	24s
Madras ,,	Finger fair to fine bold bright	22s a 27s 6d
	Bulbs ..	20s a 21s 6d
Do. ,,	Finger .	20s
Cochin ,,	Bulbs ..	7s a 7s 6d
VANILLOES— lb.		
Mauritius 1sts	Gd. crysallized 3½ a 9 in	16s a 26s 6d
Bourbon 2nds	Foxy & reddish 4½ a 8 ,,	15s a 18s
Seychelles 3rds	Lean and inferior ...	8s a 13s
VERMILION lb.	Fine, pure, bright ...	3s a 3s 3s
WAX, Japan, squares cwt	Good white hard ...	33s 6d

THE

AGRICULTURAL MAGAZINE,

COLOMBO.

Added as a Supplement Monthly to the "TROPICAL AGRICULTURIST."

The following pages include the Contents of the *Agricultural Magazine* for July :—

Vol. XIII.] JULY, 1901. [No. 1.

OURSELVES.

THE present number of the *Agricultural Magazine* begins a new volume. With the issue of the last number, the publication completed the 12th year of its existence, and is therefore now entering upon its 13th—a good age for a Ceylon Magazine. There may be ventures of a similar character that have been carried on for longer periods, but we fear that these will be found to have passed through occasional seasons of hibernation, while our own monthly has appeared for a dozen years without a break. A bound collection of past volumes should, to the local agriculturist, prove as full as the proverbial egg; and in saying this we make no boast to ourselves, though we would wish to impress upon those for whom we labour (with no recompense to speak of) that they are bound to learn much and to derive much help by taking in the *Agricultural Magazine*, the subscription to which is the modest sum of Rs. 3 per anuum. We have endeavoured with each new volume to increase the usefulness of its contents to our readers, and we hope to make the present volume still more useful by furnishing information on home industries and practical hints connected therewith, in addition to papers concerned with practical Agriculture and Horticulture.

We take this occasion, on the opening of a new volume, to thank our contemporaries for their kind countenance and our readers for their support and encouragement.

THE EDITOR.

RAINFALL TAKEN AT THE SCHOOL OF AGRICULTURE DURING THE MONTH OF JUNE, 1901.

1	Saturday	·05	17	Monday	·21
2	Sunday	·15	18	Tuesday	·25
3	Monday	·07	19	Wednesday	·04
4	Tuesday	·01	20	Thursday	Nil
5	Wednesday	·23	21	Friday	Nil
6	Thursday	·03	22	Saturday	·02
7	Friday	·36	23	Sunday	·07
8	Saturday	1·53	2	Monday	·21
9	Sunday	1·11	25	Tuesday	·47
10	Monday	Nil	26	Wednesday	·89
11	Tuesday	·03	27	Thursday	·11
12	Wednesday	Nil	28	Friday	Nil
13	Thursday	Nil	29	Saturday	·01
14	Friday	Nil	30	Sunday	Nil
15	Saturday	Nil			
16	Sunday	·99			
				Total	6·79
				Mean	·21

Greatest amount of rainfall registered in 24 hours on the 8th inst. 1·53 inches.

Recorded by C. DRIEBERG.

OCCASIONAL NOTES.

The *Queensland Agricultural Gazette* refers to the decision of the Ceylon Government to carry on agricultural work though rural schools with connected school gardens as "a step forward." Let us hope that the progression will continue.

The village industry of desiccating the pulp and seeds of the jak fruit is larger than is generally supposed; in fact, though most people are familiar with the jak nuts that have been dried and stowed away in sand—treatment which permits of the seeds being kept for future use, and which at the same time improves their flavour—few have probably seen the sun-dried pulp (dried with or without previous boiling) which is a convenient form of reserve food to be soaked and cooked (like apple chips) whenever required.

There are many parts (such as the Kesbewe district) in which the industry is common, and where it is found to be rather a profitable business. We have been informed that when jaks are plentiful they sell for 3 cents (equivalent to a ½d.) each, and that in seasons when they are scarce the dry stuff fetches as much as 6 cts. per lb., and jak fruits may weigh anything from 6 to 60 lbs.

Among our latest visitors from abroad (and there are many that call at the Colombo School of Agriculture—now, alas! only so in name) was Dr. F. Stuhlmann of German East Africa, who has lately been touring in India, Java, and the East generally. The doctor is a most interesting personage, and has a fund of information to entertain one with, not merely regarding his own African experiences—botanical and agricultural—but also with reference to the various countries he has been so fortunate as to visit with a view to studying their economic conditions. We are making a fairly representative collection of the vegetable products of the Island which Doctor Stuhlmann wants for a museum in which he is interested.

An Australian exchange in taking over an article on the composition of Indian cows' and buffaloes' milk remarks that some information re-regarding the quantity of milk yielded by milch buffaloes would be desirable. In north-west India the buffalo as a milk animal is found at its best. Mr. Mollison, late of the Poona Farm, in his paper on the Management of Dairy Cattle in India, speaks of buffaloes "giving over 30 lbs. of milk per day (a quantity sufficient to make 3 lbs. of butter), and of an average animal yielding 18 lbs. per day while suckling her calf. In his report on the Poona Farm for 1893, the same authority records that the best buffaloes yielded during the period of lactation (371 days) 6,959 lbs. of milk, and the worst (during 227 days) 1,971 lbs." This will give some idea of the milking capacity of the Indian buffalo. At the time of our visit to the Poona Dairy in 1893, the best buffalo was giving 36 lbs. per day.

In this connection it would be interesting to compare the yield of certain animals at the Allahabad Dairy Farm. In a recent account of a visit to this institution mention is made of a buffalo giving 32 seers of milk (a seer = 2 lbs.) equal to 5 lbs. of butter per day, and of a cow of the Hansi breed yielding 26 quarts of milk per day. We shall say more about the Allahabad Dairy and its successful work in another issue.

Mr. George Weerakoon, Mudaliyar of Wellaboda Pattu, Matara, draws our attention to the reported extraordinary flowering of the bamboo in Central India. The area over which the flowering extends is estimated at 1,200 sq. miles, and with the exception of a few isolated clumps the flowering is said to be universal. The extraordinary point is that clumps of all ages are seen in flower. Last year, it is said, the drought brought about flowering in the Dhaba Range of this district, where the bamboo produced a kind of manna, the seeds keeping thousands in food for some weeks; so that this year it is expected that the entire population will flock, in a short time, to gather the seed. To the people in the vicinity it is said the result of flowering will be serious owing to the impending death of the bamboos. The oldest inhabitants recall the gregarious flowering of bamboos over fairly large areas some 60 years ago, a circumstance which points to the not unlikely fact that the bamboo found in the district flowers at intervals of about 30 years.

Mr. Weerakoon states that he remembers seeing a sample of the bamboo seed brought from Bintenne in the Badulla district some 35 years ago. The "paddy" as well as the "rice" resembled the products of *oryza sativa*, and in taste resembled el-wí or hill paddy. It would be interesting, as our correspondent remarks, to ascertain from Bintenne how often seed has been produced since then, and if it is procurable at present. We trust some of our readers will give the desired information.

Since wirting the above we find a reference to the extraordinary flowering of bamboos in the last (June) number of the *Indian Agriculturist.* The approximate area over which the flowering is taking place is put down at "75,000 acres extending 50 miles from North to South, along belts 3 to 8 miles broad." Cart loads of bamboo grain are now seen plying along the roads, and no action is taken to arrest collection by the natives, as the deficiency of rain has produced scarcity of ordinary food grains, while this same drought has no doubt brought about the seeding of bamboos. The flour is either mixed with "Jowari" (*Sorghum vulgare*) or eaten by itself after preparation into flour cakes. It is considered nutritious by the natives, but it would be interesting to ascertain (as we hope to do) its chemical composition, and its true value as food.

MORE ABOUT AGRICULTURAL EDUCATION FOR COUNTRY DISTRICTS.

In the April number of the *Queensland Agricultural Journal* Mr. F. W. Teck deals with the question of Agricultural Education for our country districts, and many of the arguments in his paper apply forcibly to local conditions.

It is no wonder, says the writer, that with the conditions of life as it is generally found among the cultivating classes, our young country folk get dissatisfied with their isolated position and crowd into towns where life is made to appear more pleasant if not so healthy and independent. The pleasures of a town life and the alluring fixed period of work per day tend to attract the sons of the soil, who should be brought up to have a stronger liking for agricultural pursuits by better systems of education and by practical teaching. And how, it is asked, are the children of the rural districts brought up? As soon as they are old enough they are expected

to follow in the old-fashioned ways, the old "Jig-Jog" of their parents, while the school teacher has to do all he can to prevent their absence from school. But what little is learnt in the school is soon forgotten, and that little is of small service to the rustic. No difference is made between the teaching in town and in country schools in the midst of agricultural districts. Nothing is done to meet the difficulties in which the people of these latter districts are placed. The system of teaching and the curriculum laid down by educational authorities are undoubtedly good, but so far as our country districts are concerned, are susceptible of much improvement, as the curriculum is more applicable to town children. What is desired is an education in our country schools by which children may be instructed in such matters as have a bearing on their every day life. The writer suggests the introduction of a series of Agricultural Readers, forming a continuous upward course of instruction. These, he says, would be of great value, while being attractive and interesting.

Again, the writer, recommends object lessons and cultivated school plots for the teaching and practical illustration of the rudiments and elementary science of agriculture. It is also suggested that prizes should be offered for the best-kept home or school garden and for essays on subjects of agricultural and rural importance. Though he is ready to admit that he may not have hit upon the best methods of teaching, he believes that the general outlines he has traced would be most suitablle for the children's calling in after life. It will no doubt be stated by those engaged in teaching and those connected with the educational staff that there is no room for teaching agricultural subjects, the daily routine of work being already crowded and the teacher's time taxed to the utmost. Granted, but are there not some subjects that could be easily dispensed with in country schools, especially during the later years of school life when the system of practical instruction should take the foremost place in the curriculum? One of England's greatest statesmen is quoted to have said that "the successful pursuit of Agriculture demands the exercise of a broader intelligence than any other calling." But do our educational arbiters recognise this fact at all?

COCONUTS.

The Benefits of Mulching.—Mr. J. T. Last, F.R.C.S. writes as follows upon the benefits of cultivation as he has found them at Mangapwani:—"There are at Mangapwani about 300 bearing palms from which the nuts are gathered every three months. About three years ago I had the ground well dug up for some six feet round the base of each tree, and then packed round the tree any manure, grass or vegetable matter I could get, covering the same up with soil. This has been repeated every year. The result of these operations is that the number of nuts gathered has greatly increased.

Yield of Nuts.—Formerly the three-monthly gathering would average about 3,000 nuts, now more than double that amount is obtained. The last gathering reached the number of 7,033. Since I started mulching the trees there have always been one or more trees at each three-monthly gathering from which I obtained 100 nuts. At this gathering 110 nuts were gathered from one tree, 100 from two, 91 from one, 89 from one, 86 from one, and 80 from one, making a total of 656 nuts from seven trees.

I think, judging from the above results, we could fairly expect that with proper attention a healthy full-grown coconut tree will produce 100 nuts a year.

Coconuts in Zanzibar.—The average yield of nuts in Zanzibar Island is from 25 to 30 per tree. Calculating the price at Rs. 20 per 1,000 and the yield at 30, there will be a gross return of $9\frac{3}{5}$ annas per tree. Gathering may be set down at Rs. 4 per 1,000, which leaves a net return of about $7\frac{1}{3}$ annas or half a rupee per tree.

Pemba trees yield less, the average being probably less than 15 nuts per tree per annum. But labour is cheaper and cost of gathering less, about Rs. 3 per 1,000; so that the net return works out about $4\frac{1}{3}$ annas per tree.

Planting Nuts.—Dr. Krapf in his Swahili Dictionary has the following note:—The natives plant the coconut on the 14th day of the moon, because the moon is then at her full power. This takes place before the rain. They take care that the bud is placed downwards in the pit which is dug to the depth of a cubit. The tree (like the mango) requires five years' growth before it bears fruit.

The generally accepted way of planting a nut is to lay it on its side in a trench about 7-8 inches deep (its own depth.) It has been rightly pointed out that if a nut be planted eyes downwards, the young shoot may rot before it reaches the surface; on the other hand if planted eyes upwards the milk inside, which is especially provided for the first nourishment of the germ, will settle at the bottom of the nut and the young shoot will then run a risk of being dried up. Nature seems to have especially pointed both ends of the nut so that having fallen from the tree it shall remain upon its side to germinate. In the case of the mangrove the young seedling drops from the parent tree upon its pointed end and sticks in the mud and grows forthwith. But the bottom of the coconut could not have been pointed to enable it likewise to stick in the sand and germinate, because a nut always falls upon its side. This is well shown by dropping a few nuts from the roof of a high house. If the nut is suspended by the stalk, in the way it hangs upon a tree, and dropped, it will turn half over and fall sideways. The same thing happens if the nut be held upside down. If it be held horizontally it will maintain this position till it reaches the ground. Nature is always a safe guide. Allow a space of nine inches or a foot between the nuts in the trench, and 18 inches between the trenches. This gives plenty of room to lift the nuts when the time comes for them to be planted out, without doing much damage to the roots. April is the best time to plant out the seedlings, when they should be 5 or 6 months old. Hence the nuts should be planted in the nursery in November. But no hard and fast rule need be laid down, especially as our

seasons are uncertain. 35 feet by 35 feet is a good distance for them to be placed in the plantation. This gives 35 trees to the acre.

[The above notes are culled from *The Shamba.* —ED. *A.M.*]

MILKING.

[The following interesting Prize-essay on milking was written by Mr. J. Petersen, of Dalum Agricultural College, Denmark, and translated for the Cape Colony Agricultural Journal by Mr. Arthur Muller of Clare College, Cambridge]:—

CHAPTER I.—INTRODUCTORY.

The udder is, from the point of view of the milker, the most important part of the cow. That a proper use developes the living instrument is a maxim that applies to the udder of a cow as well as to a multitude of other things.

That use developes the instrument is easily shown by example. A workman knows that unusual labour causes a strain at first. The sower feels tired in his right arm, the harvester tired in the back, the milker tired in his arms and hands, etc., but before long they accomplish the one-sided work without feeling much strain or tiredness. Only the use which causes considerable exertion brings on further development. The way to exert the udder is to milk it completely dry. The milker should imitate the greedy calf, which sucks the last drop of milk out; this causes a greater flow of blood to the glands of the udder, and it is from the blood that all material for further development and for the forming of more milk must be sought.

It is in the above facts that one finds an explanation of the case (so common in Denmark) of the agricultural labourer's wife getting quite a lot of milk from her cow, which on a large farm would be found useless for the dairy. Whoever undertakes milking should certainly know the above facts.

CHAPTER II.—HOW TO MILK.

The object of milking is to empty—as completely as possible—all the milk present in the udder, and in such a way that the cow finds it a pleasant sensation, and that the milk is kept clean.

The cow is by nature meant to nourish its young. We ought therefore to learn from the calf. The latter does not suck its mother in a brutal manner; on the contrary, it knows by instinct that if it wants milk it must behave properly. Therefore it never grabs a teat at once, but asks, by touching the belly and then the udder, if it may.

The milker ought to begin by speaking kindly to the cow, patting it, and afterwards with the back of the hand rubbing it gently on the belly and udder. By this means one not only puts the cow into a good temper, but the rubbing helps to get rid of loose hairs, scales and dust, etc., which otherwise easily find their way into the milk pail.

Next the milk pail is placed under the udder (always on the same side of the same cow), and the work is begun by catching hold round both the front teats with the whole hands. The hands are now in turn moved up against the udder with a gentle pressure, and they are then closed slowly and softly (likewise in turn) about the teat, the closing beginning at the top and extending downwards.

These gentle movements should be continued until one notices that the cow lets the milk "come." The milk must now be emptied out in long unbroken jets by means of the same movements of the hands as before, but applied with more vigour than at the beginning. For every fresh grip the hand ought to exert a new pressure up against the udder, while at the same moment the first finger and thumb should grasp that portion of the udder which lies exactly above the teat. During this part of the milking the conscientious milker ought to fix the whole of his attention on his work, since *every interruption means a loss of milk.* Hence all loud talk or noise, which disturbs the cow as well as the man, is to be strictly avoided. A good enlivening song need not, however, be out of place.

When the front teats give no more milk, the work is carried on—without the preliminaries of patting, rubbing and so on—in the same way as regards the back teats.

The milk must be *squeezed*—not dragged—out of the teat. The teat should therefore be grasped with the whole hand, and the latter must not slide up and down the teat more than necessary. The sort of milking which is carried out by grasping the top of the teat with the thumb and first finger or thumb and second finger (the latter is the worse) and then pressing the fingers together and dragging them down the teat, is very bad indeed. The cow does not like it since it irritates the skin on the teat, and easily causes sores, and it is really much harder work for the milker.

In the case of those heifers, however, whose teats are too short for the whole hand to grasp them, the fingers must of course be used.

The milking is not over, even when the back teats (or the last milked) give no more milk. *A vigorous second milking must now take place.* After one has again changed a few times from the first milked to the last milked teat and back again, the udder must be thoroughly "worked" by means of gentle handling and afterwards the last drops of milk must be squeezed out of the teats.

Here we could also learn from Nature. Look at the lamb, when it sucks! See how it pushes its mother's udder when the teat gives too little milk.

The little pig also can be seen poking its mother by means of its soft snout, so as to get all the milk possible.

One would almost think that they found the last milk sweeter than the first! So they no doubt do, as it has been proved by a number of investigations that it is *by far* the richest.

If the first half pounds of milk are mixed (equal amounts being taken from the four teats) from each of say 40 cows, the 20 pounds of milk thus collected will as a rule not even produce half a pound of butter.

But if in the same way one were to collect the last half pounds, which after inadequate milking can still be worked out of the udders of the same 40 cows, nearly 2 pounds of butter can be got out of the 20 pounds of milk.

Any milker can roughly prove this for himself. Collect the first jet from a teat in a small glass,

and the last jet (or the last drops) which can be squeezed out of the same teat in another glass. Place the two small glasses in a cool place; and after 24 hours it is astonishing to see the great difference there is in the layer of cream. The first milk is only good skimmed milk, while the last is nearly their cream. Getting out all the possible milk is therefore of importance not only for the development of the cow's power of giving milk, but also for obtaining rich milk. Thus the milker who does not take sufficient time to milk the cow quite dry, either does not know her or his work, or is not carrying it out conscientiously.

After the milking is finished the cow should again be patted in a soothing way, and a kind word may again be said to her. The milker should always keep an eye on the state of health of the udder and teats. If swellings or lumps or tenderness in the udder, sores on the teats or blocked milk channels are observed, or the milk looks unnatural (for example, lumpy, reddish, etc.), the owner or other responsible person should be at once informed.

As disease of the udder and teats are often infectious, such cows should always be milked last, and the milk from the diseased udder should be carefully put in a separate pail and thoroughly disinfected (and then thrown away, of course) or thrown away where it cannot spread the infection.

The milk canal inside the teat is occasionally very narrow or has a frequent tendency to get blocked. To make use of a straw or such means to clear it, is very wrong, as it can set up inflammation in the corresponding gland. A teat with a blocked milk canal should be rolled gently between the hands held out flat and then carefully milked.

After the first calf the heifer is apt to feel tender and hence inclined to object the milker's touch. This tenderness lasts, in a few cases, to the later years. In such cases one must set about milking with even greater gentleness and care. Nothing but kindness should be used unless the cow is very "wicked."

To milk quite dry, as a means of milk-giving power to a cow, is especially important in the case of a heifer after its first calf; since it acts with even greater power on the heifer than on the older cow.

It would be a good thing if every milker was provided with two smocks of washable material, one being always in the wash or clean, so that a clean one may be put on at least once a week. As one ought to milk with bare arms, these blouses should have short sleeves and be made so that they can easily be slipped on over the ordinary dress.

In wet weather, when milking is done out of doors, a waterproof cloak is almost a necessity. It should be a point of honour for the milker to see that all pails, etc., in which the milk is collected should be absolutely clean. This scrupulous cleanliness is of course a necessity. The pails, etc., are best made of tin-plated steel and must not be allowed to rust.

Complete cleaning is best and most easily done as follows:—Immediately they are finished with, the pails are washed with two or three lots of cold water; afterwards they are completely covered both inside and outside with thick lime water, then scrubbed with cold water, rinsed and washed again two or three times in clean cold water, and finally in clean boiling water, and then allowed to drain dry in the open air; they must *not be* wiped with a cloth nor with anything else.

Be it morning, noon, or evening, the hands must be carefully washed before going to milking, and if the milking is done indoors one should also wash and dry the hands whenever they get at all dirty. For the sake of cleanliness it is best to milk with dry hands.

(*To be concluded.*)

AGRICULTURE IN THE TRANSVAAL AND ORANGE RIVER COLONIES.

[The following reference to Agriculture in the Transvaal and Orange River Colonies is taken from a reprint of a lecture delivered by Prof. Wallace on Agriculture in South Africa, delivered at the Royal Colonial Institute on March 12th last. The reference should prove interesting at the present time when so large a number of the late inhabitants of these colonies is in our midst. We shall probably make further extracts from this interesting paper.—ED. *A.M.*]

The Transvaal and the Orange River Colonies are grassy, pastoral, and essentially cattle countries. The area of the Transvaal is similar to that of France, while that of the Orange River Colony is less in the proportion of about 70 to 114.

Witwatersrand, or White Waters Ridge, is the watershed of two great river systems, being the highest surface traversing for about 300 miles, in an east to west direction, the elevated plateau of the "Hoogeveld" or High Veld of which the Transvaal forms a part. All the water to the north discharges into the Limpopo, the northern boundary of the Colony, and that to the south into the Vaal. The name Transvaal implies the position of the Vaal as the southern boundary. Johannesburg on the highest part of the "Rand," as it is curtly designated, is 5,735 feet above sea level (at Park Railway Station). To the north as well as to the south the elevation falls away pretty rapidly, so that Pretoria, the capital, only 35 miles to the north, is 1,600 feet lower, and Heidelberg, which is almost a like distance to the south-east, stands at only 4,900 feet. Kimberley, to the west of the Orange River State, has an elevation of 4,012 feet. The climate of Johannesburg is one of the coolest in Africa, the hot weather lasting for barely four months, while at Kimberley it extends to eight months in the year.

The high country—4,000 feet or upwards above sea level—occupies the southern section of the Colony.

North of this is the Bush-veld or bush country, at a lower level and having a warmer climate. In places it is broken by a series of hills, and it is covered with high grass, bush, and trees.

The south-eastern parts, including New Scotland, are specially suitable for sheep-breeding as well as for agriculture, the high central area for cattle and corn, the northern and lower elevations for coffee and sugar plantations and for tropical fruit

culture. Good tobacco is largely grown in the Transvaal for export to other districts of South Africa. Maize, Kafir corn and other tropical or semi-tropical crops are grown in summer when rains are abundant.

In some parts, as near Pretoria, maize, the most extensively cultivated crop of all, only grows well on river banks, in the alluvial soil found there. European cereals suffer from rust and from hailstorms during the summer or wet season, and probably only one crop in five years could be secured. Oats are not so much injured as wheat. A variety known as the Sidonian oat, brought from Australia by way of Natal, is not affected by rust and is grown during summer. Planted in December and January, it is ripe in April and May. The Boer oat grows in suitable soils or where irrigation is possible during the dry season of winter.

Potatoes grow freely, and lucerne does remarkably well, and when planted in alluvial soil that can be irrigated during the dry weather, after frosts have disappeared, it can be cut as many as eight times in one year. Turnips and swedes, which suffer from the attacks of fungi, especially in a very dry season, do not always prosper, but mangels do better. Frosts are liable to do considerable damage, especially in the low-lying areas.

The high-veld plateau, healthy for cattle and sheep in summer, is too cold in winter when the grass is dry and hard, and the animals are moved off in May to the lower and warmer country, where sweet grass and shelter are both more abundant in the "Bankenveld," or terrace country to the eastern side of the Drakensberg range on the Natal and Swaziland borders, or to the north of the Magaliesberg mountains, to return in September after rain falls. The dry and withered grass on immense areas of the high-weld is burnt off during September, chiefly with the object of destroying ticks which swarm in countless myriads on cattle from land which has escaped burning. The ticks are then so numerous that the cattle cannot thrive, and moreover are liable to suffer from red-water or Texas fever. The periodical burning is of recent introduction, since ticks were brought into the country by "transport riders" (cattle-waggon carriers) from Natal, and the practice has so much injured the pastures that fewer cattle can now be kept than formerly on a given area, and the quality has also gone back in consequence.

Horses are bred on the high-veld, especially to the south-east, but they do not exceed more than two to five per cent. of the live stock. In Baustoland, the greatest horse-breeding centre of South Africa, they number from ten to twenty-five per cent. of the live stock. On the low ground of all the Colonies and other dependencies, and in the valleys even at considerable elevations, horses and also mules are subject especially during summer (February being the worst month) to uncertain and intermittent outbreaks of the deadly horse-sickness, a disease peculiar to South Africa. It is contracted by them at night when they are exposed in the open air. They take into their circulatory systems the germs of a filamentous fungus, *Œdema mycosis*, of the form of a beer barrel, which are carried by thin streaks of mist rising from the veld when climatic conditions are suitable for their propagation. About eight or nine days after such an exposure, or after eating grass from which the moisture deposited by the mist had not been dried up by the sun, very few affected animals escape death by suffocation induced by serum escaping into the air passages from the affected lung structure.

The Transvaal is now outside the area which is recognised to be affected by "tsetse fly," though at one time the river valleys, especially to the north and north-east, were included in it. The pest has disappeared from the whole of South Africa south of the lower area of the valley of the Limpopo and a comparatively narrow belt of coast country surrounding Delagoa Bay and terminating in the south at St. Lucia Bay.

The wholesale destruction of the large wild game, more especially the South African buffalo, has conferred this solitary advantage upon the country as a solatium for the injury which has thereby resulted.

A good deal of a mild type of malarial fever exists, especially in summer in the low and humid parts, but it is not confined to these areas. It was present at Pretoria when the waterworks were formed, on the surface of the hard dry land above the city being broken.

The country is well provided with springs of good water.

The Orange River Colony occupies the important area of high-veld lying to the south of the Transvaal. In the eastern part of the Colony the Drakensberg and subordinate ranges of mountains occur. The great breadth of the country is a rolling, grassy plain, with a general trend to the west and north-west. Like the Transvaal, it at one time grew coarse grass, and supported immense herds of antelopes and other species of wild game, very few of which remain. But now finer and sweeter grasses prevail, and the country is stocked chiefly with cattle and a few horses, and in certain places with sheep. From the higher and more exposed parts stock require to be removed to lower and more sheltered and more succulent pastures during winter. In what is known as the "Conquered Territory," to the south-east of the centre of the Colony, is the chief agricultural district, about 100 miles in length and 30 miles in breath. The soil is rich and capable of growing good crops of cereals of all kinds, including wheat, without being manured or irrigated. It may be looked upon as a continuation of Basutoland—the granary of South Africa. Wheat produces 30 up to 80 fold even on land which has grown grain crops successively for a number of years. Farms usually range in extent from 1,000 to 3,000 acres, and the value of the land with buildings upon it is about £1 per acre Considerable numbers of both sheep and cattte of improved types are bred in the district.

ABOUT MANGOES.

(Concluded.)

Mr. Knight certainly deserves the sincerest thanks of all mango growers for making known

his process and experience. If others can achieve a like success we need not long have inferior mangoes in Queensland, for every bad tree can be converted into a good one. Mr. Knight says:—"It has been suggested that there is some room for improvements in our mangoes, and the writer is of that opinion also." Undoubtedly there is, and no time should be lost. Even in the West Indies, where so many fine kinds exist, it is thought desirable to import new strains from the East Indies. The following is from No. 24, *Trinidad Bulletin*:—"It has been thought advisable to import once more a number of selected varieties from the East, and to this end application was made to the Indian authorities for the best kinds from the various provinces, and cases of plants have been ordered from the Bombay, Bengal, and Madras Presidencies. It is almost certain we do not possess all the types of various strains of mango grown in the East, and although our number of seedling varieties is legion, yet it is probable the introduction of further East Indian kinds will be of great advantage in the endeavour to improve the strains now cultivated in the Western World."

We are not half as far from India as Trinidad is, and we have frequent and speedy steam communication. How much easier, then, for Queensland to get supplied than the West Indies.

When mango plants are next imported, a trial might be made of branches for grafting by Mr. Knight's method. He says:—"Experiments have proved beyond a doubt that sections of the mango-tree will keep good for grafting purposes from three to six months' time, according to variety and to the constitution of the tree from which they are obtained. This gives us the opportunity to import sections of the most desirable class of tree from any part of the globe with a certainty of their growing when properly prepared and tied on."

May not Mr. Knight be induced to go to India and procure a quantity of branches and plants of the choicest varieties? His doing so would be an inestimable boon to Australia. Branches in Wardian cases or simply in boxes having holes perforated at the sides near the top to admit air might easily be imported. I have in this way received fruit trees from California in first-rate condition, all of which grew; indeed, they could not have been better had they come from Sydney or Melbourne.

I have heard it remarked in Melbourne and in Sydney, "You Queenslanders keep your good mangoes for yourselves and send us your rubbish." My reply was, "This is not so; you have much the same mangoes as are sold in our shops, most of which are poor." Those who make mango growing a business should bestow particular attention on the keeping properties of their fruit, as well as excellence in other directions; also to careful grading and packing. Greater care should also be taken in transit. I have seen cases standing on their side and on end, and very roughly handled. This, I must say, has not been in our market. The carriage of mangoes long distances is a problem that is not yet been satisfactorily solved. I have eaten mangoes in London from the West Indies, and in New Zealand from the Islands; they were wretchedly poor. The cause was probably owing to the necessity for picking them unripe.

I noticed on a visit to the market recently quantities of mangoes being sold by auction; 3s. per case was the highest price realised. I saw a couple of hours afterwards, at a fruiterer's, two cases, for which he informed me he had paid 7s. a case. They were certainly a very fine sample, in excellent condition, fairly large, clean, and not over-ripe; he was confident they would keep good a week or more if necessary; he expected to realise *2d.* each for all of them. This is an instance of how desirable it is to cultivate only good varieties.

There are various points that go to make a good mango—on the outside, size, form, colour and texture of skin; inside, freedom from fibre, size of stone, and, most important of all, flavour. It is very rare to find all these conditions in the same fruit. The finest-flavoured mango I ever tasted was at the Island of St. Helena, South Atlantic; but it possessed no other condition of excellence, the price it realised was one shilling each. This and other fruit trees were brought to the island by Captain Bligh in H.M.S. "Providence" from Timor and the South Seas in 1792. I never saw a handsomer mango than one grown at Wickham terrace; it was entirely free from fibre, but had an enormous stone, was destitute of flavour and otherwise worthless. In marked contrast was one produced here, of fine form and colour, and without a blemish. It weighed 18 oz., the stone ¾ oz.; it was quite free from fibre, and of delicious flavour. The tree is a shy bearer, and is this year without fruit. The specimen described was exceptional, the next being a bad second in size, though equal in other respects.

The nomenclature of mangoes seems to be in a hopeless state of confusion. This is greatly owing to the immense variety we have, and to our ignorance on the subject. I have seen several distinct kinds called the "Bombay." As well may we speak of the strawberry as the "London," simply because it originally came from London, or an apple the "English" because it came from England. Eight or nine distinct varieties are known as the "Apple" and as many as the "Strawberry," though why they are so named it is difficult to tell. They do not resemble the apple or strawberry in appearance, flavour, or anything else. Mr. Parker, who has given considerable attention to the cultivation of mangoes, has this season been fortunate in producing a new variety; it is of peculiar form, fairly large, of good colour, free from fibre, small stone, and of excellent flavour. The mango is so good that it is thought worthy of being named "Bobs."

FIRST STEPS IN AGRICULTURE.

First Stage—2nd Lesson.

BY A. J. B.

In our last lesson I explained to you the necessity of ploughing and otherwise working the soil, which work is included in the word "culti-

vation." You know that the farmer is not always ploughing his land. If he were to do nothing else but plough, he would not be able to sow any crops. There are certain times and seasons when ploughing has to be done, and there are seasons when the farmer and his men attend to other work.

You are not too young to understand why some crops grow best during the winter and others during the summer. I will therefore give you a short lesson on what I will call the "seasonable" work on the farm.

There are few Queensland children who do not know what maize is; only they know it by the name of "corn." Well, maize does not like cold weather. On a right frosty morning you like to get near a good fire, or, if you go out, you like to have a warm coat on. But a maize plant or a sugar-cane plant has no warm coat to protect it from the cold, so, if either of them happen to have been planted at a wrong season, its tender green leaves exposed to the frosty air of night become frost-bitten, and the whole plant dries up when the hot sun shines on it, and it withers away. Then, such plants as cauliflowers and cabbages love the cold weather, and if they are planted out of their season—that is, if they are exposed to the blazing heat of our summer—they will not thrive, and the greatest care has to be taken to make them grow at all. Then, again, the climate of Queensland changes. If you live away in the far North—at Cairns, Cooktown, or Thursday Island—you find that the weather is very hot almost all the year round; so it is on the coasts of the Gulf of Carpentaria, which you see on your map. But up on the country above the Main Range it is very cold in winter, even at Herberton in the North. So you see that all over Queensland the farmers have to remember the climate they live in, and so arrange the time for ploughing and sowing. On the Darling Downs they begin sowing the wheat in April—that is, in autumn. Then the wheat, which loves the cool weather, comes up, and if it gets sufficient rain at the proper time the farmer will expect a good crop, unless something happens which you will hear about in a future lesson.

The maize crop, on the contrary, loves the hot weather, so the farmers plough their corn land in July and August—that is, in the winter—and, as soon as there is no more fear of frost, they sow the maize, and soon the fields are covered with the beautiful dark-green maize plants, which produce their golden cobs in the height of summer.

Now, here is an easy lesson for you to learn. Remember that all the common vegetables—such as cabbages, cauliflowers, carrots, turnips, and many European vegetables—are best grown during the cold winter weather; and that sugar-cane, rice, yams, maize, melons, pumpkins, and other, what are called tropical, plants must be grown during the hot months of summer.

I told you that the farmer is not always busy ploughing the land. When his crops are sown, he has to keep the weeds down for the reasons I gave you in your first lesson. So he stops ploughing and cultivates the soil among his growing crops in order to supply them with plenty of plant food.

Then by and by his time is occupied with gathering in the harvest. In November he is busy harvesting his wheat and barley crops. In December and right up to April and May he pulls his corn. Then he has to dig his potatoes twice in a year, besides gathering vegetables. And again he has fields of lucerne to cut and turn into hay. And so, all the year round, each season brings its round of duties, and the farmer who does not watch the seasons, and who does not plough, sow, and plant at the proper time, will lose a great deal of time and money.

Now, having explained to you the necessity for watching the seasons, you can easily understand how a farmer may lose a great deal by ploughing and sowing too late. If he puts in a crop in June which should have been sown in April, he is a bad farmer, and almost deserves to lose his time and reap a bad crop. And if he is too great a hurry and hopes to get his crop out before his neighbour, and so plants in April instead of in August, he is just as bad a farmer, and can blame nobody but himself for his want of success.

Before we finish this lesson, I must tell you that all soils, although close to each other, are not alike. I may have a farm of which the soil is rich, and deep, and warm, and sheltered from cold and violent winds. My neighbour's farm has a stiff, cold soil exposed to the strong winds. If my neighbour and I were to cultivate our farms in exactly the same way, one of us would be doing wrong, and would suffer for our want of knowledge. If his farm is wet and cold, he must do something to the soil to get rid of the wet, and to warm it. If mine is too dry and too light, I must do something to retain the moisture and to make the land less lose and porous. So you see that every farmer has to learn what to do to his land so that it may yield him good crops.

Here are eleven more questions, the answers to which you can supply from what I have just told you.

Questions on Lesson 2.

1.—Why does the farmer not spend all his time in ploughing the land?

2.—Name the seasons.

3.—What is meant by seasonable work?

4.—Name any plants which thrive best in hot weather?

5.—Name some that grow best in winter?

6.—Name the warm and cool portions of the colony?

7.—In what months does the farmer plant sugar-cane, sow rice, maize, wheat, barley, and kitchen vegetables?

8.—When does he begin to harvest maize and wheat?

9.—Why should the farmer watch the seasons?

10.—Is the soil on all farms of the same quality?

11.—Describe two different kinds of soil?

(*To be continued.*)